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About the covers

Among the most spectacular events at Freezout Lake Wildlife Management Area are the migrations of snow geese, ducks, and other waterfowl. At times, as many as 300,000 majestic white snow geese are present (wrap-around cover photo: Dave Books).

Many species of ducks, such as the blue-winged teal (inside front cover photo: Harry Engels), nest on the management area or stop off during migration.

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Department Lands:

FREEZOUT LAKE

WILDLIFE MANAGEMENT AREA

A testimony to the foresight of biologists and conservationists, Freezout Lake's 12,000 acres of water, fields, and marshland provide numerous benefits to hunters, bird-watchers, photographers, school children, and nature lovers (above photo: Keith Aune). Thousands of ducks—such as the mallard nestlings shown at right (photo: Tim Lucas)—are produced on the area each year.

by Dave Books

TO A DUCK or goose winging over Montana in the spring or fall, the Freezout Lake Wildlife Management Area, located two miles northwest of Fairfield, must look like the land of plenty. During peak migration periods, the area's 12,000 acres of water, marshland, and cropland attract up to a million waterfowl! Thousands of waterfowl and shorebirds also nest at Freezout Lake, making it one of Montana's premier waterfowl production areas.

This wasn't always the case, however. Although the lake had historically been used by waterfowl, its water levels were prone to drastic fluctuations; in some years it would completely dry up. With the development of the Greenfields Irrigation District in the early 1900s, the lake became a natural sump filled with stagnant and highly alkaline wastewater; since it had no outlet, the lake periodically flooded the adjacent highway, railroad right-of-way, and agricultural fields. Officials began to talk of draining the lake to alleviate the flooding problem.

This proposal alarmed biologists and sportsmen, because sizable waterfowl production and resting areas are far from abundant in Montana. Drainage of wetlands was and continues to be one of the greatest threats facing our wildlife resource. After several studies of the area's wildlife potential, in 1953 the Montana Department of Fish and Game began to acquire and develop the area. The first problem to be tackled was construction of an eight-mile drainage canal from the lake to the Teton River. This project, which was a cooperative effort between the department and the Greenfields Irrigation District, was completed in the mid-1950s. With a means of controlling the water level in the lake, biologists could now get on with the job of managing the area for wildlife.

The objectives were threefold: (1) To develop and maintain the area in a manner that would maximize waterfowl hunting opportunities; (2) to maximize production of waterfowl, shorebirds, upland game birds, and other wildlife, and (3) to provide late summer and early fall feed for waterfowl, thus minimizing crop depredation on surrounding private land. To achieve these objectives, department personnel constructed an elaborate system of dikes and water control structures to maintain desirable water levels and encourage development of marshland vegetation; built islands to enhance waterfowl nesting; created boat launching sites, parking lots, and camping areas to accommodate public use; constructed a headquarters complex, manager's residence, and gravel road system to facilitate management; planted thousands of trees and shrubs in shelterbelts to provide cover for upland birds, and planted various grasses and grain crops to concentrate waterfowl on the management area.

In the three decades since the project began, these efforts have paid handsome dividends. Today, thousands of hunters, bird-watchers, photographers, and school children visit Freezout Lake each year to enjoy the wildlife that abounds there. Hundreds of bird species frequent the area, as do furbearing animals like muskrats, foxes, coyotes, jackrabbits, badgers, bobcats, and skunks, and occasional deer and pronghorn antelope.

Perhaps the most spectacular events are the semiannual migrations of snow geese, whistling swans, and ducks through the area. As many as 300,000 snow geese and 10,000 whistling swans are present at times. The majestic white birds blanket large expanses of water and their noisy chatter reverberates over the marshland. In the spring, Freezout Lake is the first major "staging area" for the snow geese and swans after they cross the Rockies coming from the West Coast. They concentrate at Freezout for a time, feeding and resting, gaining strength for the long push north to the Arctic. In the fall, the migration is spread out over a longer period and the concentrations are not quite as spectacular.

As many as 10,000 whistling swans stop off at the Freezout Lake Wildlife Management Area during spring and fall migrations (photo: Kristi DuBois). Waterfowl hunters from all over Montana match wits with the area's abundant ducks each autumn (left inset photo: Dave Books). The dowitcher (right inset photo: Mike Aderhold) is one of many shorebirds that use Freezout's sprawling marshlands.

Many species of ducks nest on the management area or stop off during migration. Due to the excellent water conditions and abundant food, it is a natural holding area for the hundreds of thousands of mallards and pintails that pass through in both spring and fall. As many as 100,000 pintails, decked out in elegant breeding plumage, may be present at Freezout during the peak of spring migration.

Although the area did not historically have a nesting population of Canada geese, such a population now exists there.

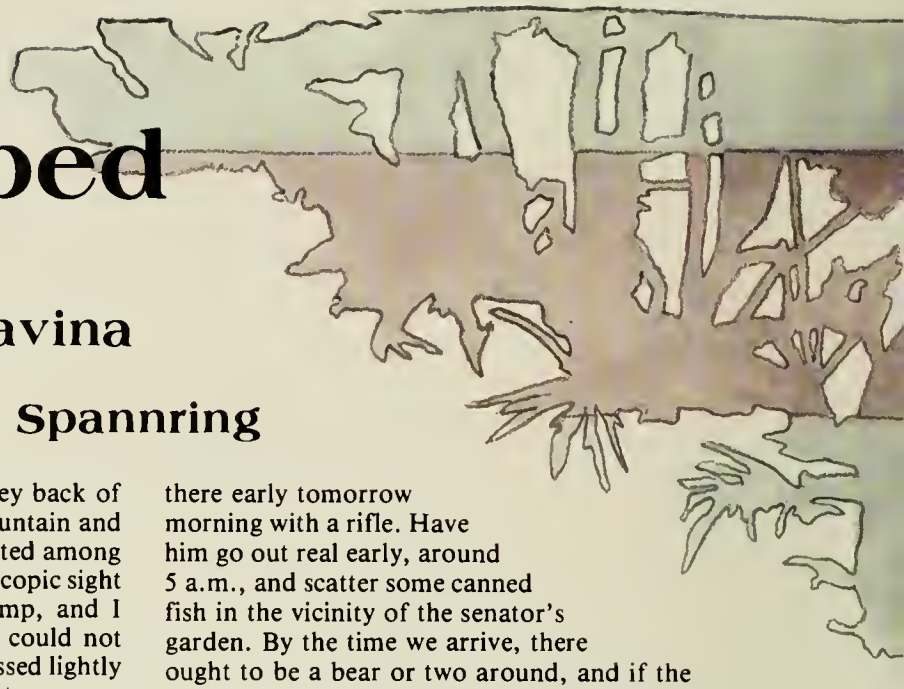
A captive goose flock was maintained for about 10 years, with periodic releases of breeding-age juveniles. This, together with development of breeding habitat, enabled a wild Canada goose population to prosper and become a permanent component of the area's wildfowl resource.

Although Freezout Lake is popular with visitors yearround, the busiest time is autumn, when waterfowlers from all over Montana arrive to try their luck in the marshes and surrounding fields. At the opening of waterfowl season in early October, anywhere from 50,000 to 100,000 ducks may be present on the management area. A portion of the area is kept closed to hunting throughout the season so the waterfowl will have a secure place to rest and loaf. Since 1970, a limited whistling swan season has been held in Teton County, Mont. This hunt, which is limited to people who are successful in drawing for one of 500 permits each year, takes place primarily at Freezout Lake.

Regardless of the season, you will find abundant opportunities to view wildlife at the Freezout Lake Wildlife Management Area. The following timetable will give you an indication of the species present at various times of year. More detailed information is available at the management area headquarters located on U.S. Highway 89, which is open weekdays from 8 a.m. to 5 p.m.

late March	migrating geese and swans
April	geese, swans, songbirds; major early species duck migration; mating flights and Canada goose nesting activities
May	ducks, shorebirds; nesting activities, new goose broods appear
June-July	broods of ducks and shorebirds
August	songbirds, shorebirds; molting time for waterfowl
Sept.-Oct.	migration of shorebirds, waterfowl
Nov.-Dec.	waterfowl, hawks, eagles
winter	hawks, owls, pheasants, Hungarian partridge, foxes, coyotes, jackrabbits

The Silver-Tipped Sweater



by A. David Cannavina

(edited by Eldon Bowman)

illustrated by Robert Spannring

As I drew down my scope on the rippling grey back of the big beast, the early sun glanced over the mountain and seemed to focus on his shoulder hump as he rooted among the raspberry bushes. The cross hairs of my telescopic sight came to rest exactly in the middle of that hump, and I knew at that distance of less than 30 yards, I could not miss. I felt a thrill of exultation as my finger pressed lightly on the trigger of my .300 H&H Magnum, ready to squeeze off the shot. In many years of hunting I had never shot a grizzly, and by all reports this was a big one with a handsome coat. That, indeed, I could see for myself!

I wasn't exactly hunting in the usual sense of the term that early summer morning in Glacier National Park when I sighted in on that big grizzly. With me were Chief Ranger Brentyn Finch and Park Ranger Chadbourne. We were there because of several recent telephone calls from summer residents at the head of beautiful Lake McDonald, among them an urgent one from U.S. Sen. Burton K. Wheeler.

"This is no black bear. He's a big grizzly and he broke down the fence and raided my garden," reported the senator. "Just yesterday he came by our cabin while I was shaving and stood on his hind legs and looked me in the eye through the window. And that window is more than six feet off the ground! I tell you this is a big fellow and he is dangerous. Somebody is going to get hurt!" declared Wheeler bluntly. "Can't you do something about it?"

As a matter of fact, Ranger Chadbourne had already set one of the conventional bear traps—a section of large steel culvert mounted on wheels—and baited it with canned salmon. But in three nights the grizzly had not entered the trap, although Chad had noted bear droppings close by. Chad reported seeing the bear twice, both times early in the morning.

Grizzly bears seldom become a problem around campgrounds in Glacier National Park. Black bears are common enough, but the bigger, more solitary, grizzly is not frequently seen by park visitors for he inhabits the backcountry and generally shuns contact with people. Rarely, an old grizzly abandons his natural way of life and turns to raiding around human habitations. Such an animal is a menace, for he fears no living thing and does not hesitate to attack anything or anybody that angers him.

These considerations were uppermost in the brief parley at Park Headquarters following Sen. Wheeler's call.

"Let's not take any chances," decided Chief Ranger Finch. "Call up Chad and tell him that you and I will be up there early tomorrow morning with a rifle. Have him go out real early, around 5 a.m., and scatter some canned fish in the vicinity of the senator's garden. By the time we arrive, there ought to be a bear or two around, and if the grizzly is there, we'll just nail him once and for all."

Accordingly, the next morning soon after 6 a.m. when Brent and I arrived at the Lake McDonald Ranger Station, Chad had already been on the prowl scattering bait. He reported no bear in the trap, which was set near the station corral where he kept two saddle horses. He said that when he first went out to the corral, the horses had snorted and galloped across the corral to the barn. He was sure that they had been frightened by a bear, probably the grizzly, for they were highly spooked and trembling when he approached them. Afterward, he had scattered the bait farther along toward the senator's garden, but said that he hadn't spent too much time at it. He jokingly added, "I was getting as jumpy as the horses!"

Chad led us through the woods beyond the corral along a faint, overgrown, deer trail in the direction of Sen. Wheeler's garden. The garden was a fenced-in plot in a natural opening of the woods about 50 yards back from the road at the head of the lake. The senator and his family used a foot trail directly from the road to the garden. We approached from another direction. In file we stalked along the bushy track slowly and silently, passing a spot where I could see and smell the fish that Chad had scattered earlier.

Suddenly Chad stopped, held up his hand, and gestured violently ahead. He dropped back a step or two as I moved up to take his place. At first I didn't see anything and crept forward a bit. Chief Ranger Finch was breathing audibly close behind me, and whispered, "If you see him, don't let him get away; let him have it."

At that moment a silver-tipped grey hump rippled, catching the rays of the early morning sun. I immediately shouldered my rifle and, in a fraction of a second, had the safety off and was looking through the scope sight with the cross hairs at rest dead center on the hump. Because of heavy vegetation around the garden, that was all I could see. The fact that Chad gestured so violently and started to retreat gave me every reason to believe the grizzly was inside the fenced garden ahead of me. I stood still, with the

cross
hairs centered
on the hump, and then be-
gan to squeeze the trigger. Sud-
denly there flashed through my mind
the admonition of my father who first put a rifle in my hands when I was a boy of 10. He had taught me to shoot it safely and to be sure of my target before pulling the trigger. But I was certain of my target. Well, *almost* certain, for I could see the hump very plainly through the four-power scope. Hadn't Chad assured me he had just seen the grizzly in the exact same spot? Hadn't Chief Ranger Finch told me not to let him get away? The stage was set and I applied a little more pressure on the trigger. Perhaps it was that fleeting thought, perhaps a sneaky little pride of mine in making a perfect shot, deliberately, without excitement; I hesitated again.

In that moment, above the shoulder hump, appeared the head...the back of the head of Burton K. Wheeler, U. S. Senator from Montana! The senator was clad in one of those shaggy silver-tipped grey wool sweaters that were in vogue in 1945.

A thousand times since then I have relived that split-moment of near-tragedy. How I hugged the gun back to my chest, pushed on the safety catch, and silently turned on my two frozen companions! I was dizzy and my stomach was gone. I gave a sign and we stole away from there as we had come, without a sound, three rangers completely unhinged.

When we were back by the corral, Brent exploded a long-held breath. "What the hell business has the senator out in his garden at six o'clock in the morning! Why

continued on page 26

GETTING READY

by Robert W. Moon and Thomas R. Whiddon

THE TRIP from the world of the factory or office to the world of towering pines, steep mountainsides, rugged trails, fleet-footed deer, and bugling elk is only a few hours in a four-wheel-drive vehicle. Yet, the energy needed to hike a steep mountain trail or pack out an elk is a world apart from the energy needed to lift levers, push buttons, or shuffle papers. Urban life has minimized the physical exertion required to get to work and perform on the job: A century ago, 33% of our work required human muscles; today, the figure is less than half of 1%. Hunting, however, has remained essentially unchanged, except for motorized vehicles and modern clothing and equipment.

You know the story. You hear it every fall. The headline reads something like this: "Elk hunter succumbs to heart attack." You ponder it over your morning coffee, and think, "It won't happen to me." And you're probably right. Thousands of hunters go afield every year, and only a few fail to return.

But there is another story, less dramatic, perhaps, but far more common. It goes something like this: A long ride through an October snowstorm heightens anticipation for the hunt. Tracking snow abounds and improves your chances for bagging a big bull elk. The first day of the hunt dawns clear and begins with great promise; you start up the mountainside filled with confidence. But the fresh, wet snow makes walking difficult, and after a few hours you're pretty well played out. You reach the crest of a ridge and stop to rest, puffing hard from exertion. Just then, a magnificent bull elk breaks from the trees in front of you. Your heaving chest makes it difficult to steady the gun, but you hurry a shot before he's out of sight; the bullet kicks up snow behind him. You quickly decide that if you run to the edge of the trees you might get another look at him before he tops the next ridge. After a 50-yard dash, you flop down in the snow. He's still in sight! But your attempt to aim and fire is pitiful at best. Exhausted, heart racing, lungs gasping for air, you curse your bad luck—you've just missed the opportunity of a lifetime.

But was it bad luck? Not really. Your cardiovascular system was inadequate to meet the demands of a rigorous hunt, and you've suffered the consequences, pain, discomfort—and failure. You've put a dangerous stress on your body, greatly increasing the risk of a cardiovascular accident. Chances are you'll be okay, but it could have been fatal. Each year, it *is* fatal for a few Montanans.

Why is it that many of us meticulously prepare for big game hunting each autumn by carefully sighting in our rifles, sharpening knives, and checking maps and gear, but woefully neglect the most important factor in the hunting equation, our own bodies? A cardiovascular fitness program need not be laborious, painful, and unpleasant. Fitness means many things to many people, but for the sportsman, it should be the ability to hunt, fish, and hike with vigor and alertness, to meet emergencies, and to be able to fully enjoy the rigors of an outdoor life.

With the right kind of a fitness program, you'll have more energy, feel stronger, maintain vitality as you grow older, and generally enjoy life more. Your heart, lungs, nervous system, and hormonal system will become more efficient, and your bones, ligaments, and tendons will get tougher. Your physique and body composition will change. Your body fat will decrease, while your muscle tone and overall appearance will improve.

The key to rediscovering your body is not to rediscover it all at once. You must realize that your cardiovascular system has been slowly adapting to a sedentary life. Stress, smoking, and a fatty diet may have contributed to the problem. Your arterial openings have begun to narrow. You must allow your cardiovascular system to adapt to increased activity slowly. The attitude that "I should have done this yesterday, but I didn't, and now I have to catch up," not only results in pain and soreness, but can be dangerous. The cardiovascular system may fail completely.

You may want to start on the road to fitness by having a fitness examination. You are encouraged to consult a physician before you start if:

- You have heart trouble, a heart murmur, or you have had a heart attack.
- You frequently have pains or pressure—in the left or midchest area, left neck area, shoulder or arm during or right after you exercise.
- You often faint or have spells of severe dizziness.
- You experience extreme breathlessness after mild exertion.

- Your blood pressure is too high and is not under control.
- You have bone or joint problems such as arthritis.
- You are over 60 and not accustomed to vigorous exercise.
- You have a family history of premature coronary heart disease.
- You have a medical condition which might need special attention, such as insulin-dependent diabetes.

Whatever your health status, begin slowly and don't expect fantastic improvements after one session or one week; if you persist, you will eventually reap the benefits. If you consider the time your body may have been out of shape, it is only natural that it will take time to get it back into good condition. A gradual approach will help you maximize benefits and minimize risks.

When beginning a fitness program, you must first decide *how* you want to get fit. Do you want to bike, walk, jog, swim, or participate in activities like racquetball, handball, tennis, or soccer? The choice is yours; most cardiovascular building programs consist of several activities. Maybe you will choose to walk or jog on Monday and Wednesday and play tennis on Friday. Select an activity or activities that you can enjoy and do consistently. Only exercises that significantly increase the blood flow to the working muscles for an extended period promote cardiovascular fitness. This rules out activities such as golf, softball, bowling, and weight lifting as cardiovascular. However, each of these may supplement a fitness program.

As with almost any regular activity, there will be times when you won't be motivated to continue. That's natural. But do try to find an exercise program that is rewarding and fun for you—and stick with it. Most things worth doing require some self-discipline, and without it you cannot hope to succeed.

The most crucial concern in the initial stages of a cardiovascular fitness program is the level at which you exercise. Start out easy. Arteries which were once smooth and open have started to narrow, reducing the blood flow to the heart. But don't be afraid to get started; doctors recommend a slow, progressive exercise program even for post-cardiac patients to restore the heart.

Two monitoring systems can be used to determine whether the exercise you are doing is adequate for cardiovascular training. The most simple is the "talk" test. If you cannot talk while you exercise, it is too hard. In other words, any time you become aware of breathing difficulty, slow your pace, back off. Exercise doesn't need to be painful. The second monitoring device is your built-in computer—the heart or pulse. Exercise physiologists have determined that a reliable prescription is to exercise at a pace so that your heart rate is 70% of the difference between 220 and your age [(220-age) × .70 = exercise heart rate]. For example, if you are 40 years of age, 220 minus 40 equals 180; multiply by .7 and your exercise pulse rate should be approximately 125. You can check your pulse either on

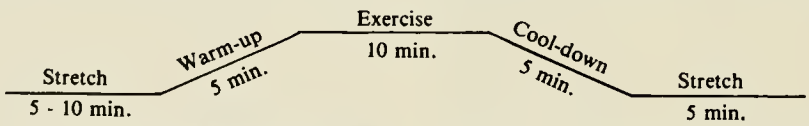
the thumb side of your wrist or at the neck to the left or right of your Adam's apple. Remember, this is only a guide. If you become uncomfortable before you reach your recommended exercise rate, slow down.

The amount of time you spend on your exercise program is up to you. Some days you may want to play handball for an hour and other days jog for 20 minutes. Again, the recommendation is to exercise for 20 minutes at your prescribed heart rate. Don't try to obtain your target pulse rate the first time.

Before you begin any activity, you should stretch for five to 10 minutes. Bend over and stretch your back, stretch your legs, neck, and arms. When you stretch, don't bounce, but come to the point where the muscle pulls and hold it for a count of 10. Then start slowly and let your body warm up, whether you are hitting a tennis ball or walking. After the warm-up period, try to attain your heart rate for a period of 10 minutes. Most people who are out of shape will feel uncomfortable trying to exercise at their target heart rate for 10 minutes. In that case, alternate between a brisk pace and a slower pace. Eventually the 10 minutes of exercise will become easier and you can extend the length one minute or so per week until you are able to exercise vigorously for 20 minutes or longer at each session.

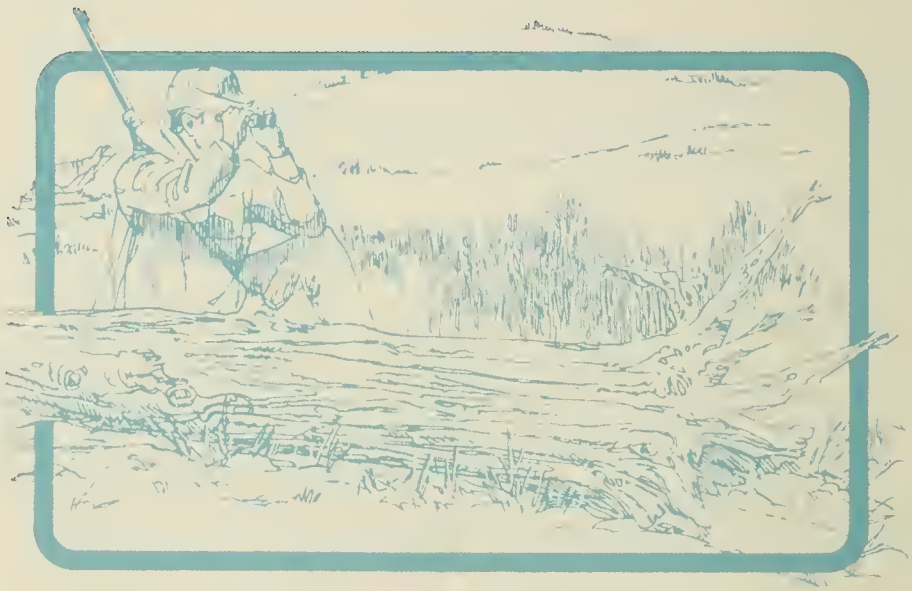
Another vital part of the fitness program is the cool-down phase. After you exercise, don't immediately sit down or jump into a shower or swimming pool. Spend at least five minutes walking, socializing, or looking at the scenery, and allow your heart to slow down. After that, a five-minute stretch is very relaxing.

A fitness program can be described graphically like this:



If exercise is to have lasting benefit and be part of the journey to enhancing the quality of your hunting, it must become routine. Start with two or three days a week and work up to a minimum of three or four days. As your fitness level increases, you may wish to exercise six or even seven days a week. On Monday, Wednesday, and Friday you may want to jog, while on Tuesday and Thursday play tennis. On the weekend you may decide to go backpacking.

While you now have the components of a fitness program, you may wish to make a few more changes in your lifestyle to enhance the cardiovascular system. They are subtle but important. You can become more active during the day by using the stairs—up and down—instead of the elevator. Start with one flight of stairs and gradually add more. Park a few blocks from work and walk the rest of the way. Take an exercise break—stretch, walk around and give your muscles and mind a chance to relax. Instead of eating that extra snack, take a brisk stroll around the neighborhood.



How do you keep motivated? Set your sights on short-term as well as long-term goals. With short-term goals, you will be less likely to push yourself too hard or too long. Also, think back to where you began. The progress will become obvious. Talk about your exercise program with family and friends. Their encouragement and understanding are important to your progress. Most important of all, tailor the activity to meet your own needs.

The choice is yours. Fitness—and maybe even that big bull elk—are within your reach! ■

The Catchall

Rediscovering Lost Skills by Mike Frisina

While traveling across what is now Montana in the early 1800s, Lewis and Clark didn't give much thought to game retrieval—the abundant wildlife of the region provided a walking delicatessen to explorer and settler alike. The hunter shot an animal, carved off a hunk of meat, and fixed dinner. But time has a way of changing things. Just as human settlement changed the face of the landscape, game hunting evolved from a necessity to a recreational pastime.

Today's game populations are faced with steadily increasing hunter demand. This heavy demand, along with accelerating removal of security cover (primarily by logging), is changing things even further. If we are going to maintain our large, healthy game populations and the excellent level of hunting opportunity we now enjoy (a general five-week season in which any licensed hunter can kill a bull elk or buck deer), lost security must be "built" back into wildlife habitat. The least restrictive way to accomplish this is by controlling road access to areas of big game concentration (see *Montana Outdoors,* Nov./Dec. 1982 issue).

Road closures have raised the question in some hunters' minds of how to retrieve their dead game animals. The ease and convenience of travel provided by four-wheel-drive vehicles has resulted in a loss of game retrieval skills in a large portion of the hunting public—skills that 40 years ago were considered essential to being a competent outdoorsman. Just as wildlife populations have had to adapt to changing times, so must hunters now adjust by dusting off rusty skills. A hunter who develops such skills can enhance his hunting experience beyond the thrill of harvesting an animal. A sense of independence and competence comes from getting an animal out of a tough place in the woods.

Some hunters believe if you don't have access with a vehicle or a horse there is no way to bring a big game animal out of the field. However, many of the retrieval methods commonly used before the popularity of the 4×4 did not involve horses. Consider the following:

1. Dragging. If there is much uphill travel or little snow cover, this is usually a poor option for retrieving an elk. If snow conditions and topography are suitable, however, dragging can be made much easier by cutting the animal in half lengthwise and removing the head and legs. Then the animal can be taken out in halves (see also No. 3).
2. Pack frame. An elk or deer downed in mountainous country can be packed out by cutting it into four "quarters" and carrying each quarter, one at a time, on a pack frame. The load, although not light, isn't as difficult to carry as some people think. The problem most people have is they don't get the load properly balanced. The weight should be distributed so that most of it lies on the hips instead of the shoulders of the carrier. Many books are available that explain in detail how to balance heavy loads on pack frames. It helps to get rid of excess weight, such as the hide—be sure, however, to leave evidence of the animal's sex on one quarter. If the distance the meat is to be carried is great, or the terrain steep, the weight can be reduced substantially by carefully boning out the meat and packing it in muslin bags, then lashing the bags onto the pack frame.

VERN CRAIG

3. Sleds. There are a variety of sleds that work well for game retrieval. These vary from standard winter sleds used for recreation to small plastic ones that can be rolled up and placed in a backpack. The small plastic sleds are inexpensive and greatly reduce the friction between hide and ground when you are dragging out an animal.
4. Carts or wheelbarrows. Once a hunter gets his animal to a road or trail that is closed to motorized vehicles, and if there isn't too much snow, placing the animal in a cart or wheelbarrow greatly reduces the work of getting the meat back to the car.

These are only a few ways to get an animal out of an area that can't be reached by motor vehicle. Be innovative—one of these methods, or one you develop, will do the job and give you a feeling of pride and accomplishment. There is more to hunting than killing an animal; if you have to make several trips, just be glad you were fortunate enough to bag an animal and consider the retrieval an opportunity to spend more time outdoors. If we are going to maintain the long hunting seasons and freedom to pursue the sport of hunting as we now do in Montana, today's hunters must be willing to work a little harder and rediscover the outdoorsman's art.

The Uncommon Caribou

According to available information, mountain caribou have never been common in Montana in historical times.

But records exist of caribou having been seen or killed. U.S. Forest Service files indicate presence of at least 20 caribou in the Kootenai National Forest as late as 1925. During the last 20 years, most of the few caribou seen have been in the extreme northwestern corner of the state in the Yaak Ranger District. The feeling—and there is little evidence to support it—is that these occasional sightings are single animals or small related groups that have wandered south from British Columbia. These animals probably are not part of the small herd that frequents the Selkirk Mountains along the northern tip of Idaho.

Interest in caribou has been rekindled by five recent developments:

(1) The Jan. 14, 1983 temporary listing (for 240 days) of the small Selkirk population as a national "endangered species." An effort is under way to make this listing permanent until the population shows a significant increase.

(2) The growing research and educational efforts of the International Mountain Caribou Technical Committee. This group of wildlife biologists, representatives from government, and other interested persons from the United States and Canada has been working since 1971 to protect and provide for the Selkirk

caribou. Its most active member, Jasper Carlton, a free-lance researcher and Forest Service volunteer, has contributed much of the recent information about the Selkirk animals.

(3) Current review and discussion of the wilderness potential of several roadless areas, including the Ten Lakes and Mount Henry areas in northwestern Montana, and their potential as a refuge for such rare animals as the grizzly, wolf, caribou, lynx, and wolverine.

(4) Forest Management Plans for the Lolo, Kootenai, Flathead, and Panhandle National forests are attempting to summarize forest wildlife resources and plan for the future. Idaho researchers believe 23 to 25 caribou use the U.S. portion of the Selkirk range. A 1973 University of Idaho report estimated the Selkirk population at between 25 and 30. Most, possibly all, of these animals spend at least part of the year in Canada.

(5) The state of Idaho has embarked on a three-year project to determine the areas caribou are using, the preferred habitat, and possible ways of minimizing the impact of other forests uses on caribou.

The major problems with the Selkirk caribou include:

(1) Road kills along British Columbia Highway #3, five miles north of the border. This highway is salted in the winter, and the salt attracts the caribou.

(2) Mistaken kills, three in the last three years, by hunters after elk, or possibly poaching.

(3) Destruction of old-growth forest. Caribou prefer forests 100 years old and older.

(4) Road construction and lack of management on closed roads.

In Montana, the caribou is technically a game animal with a closed season; it is now regarded as an animal of "special concern." The animals have been documented from one to four times a decade since 1930. State records show only three reliable sightings since 1971: (1) five cows in the Blue Creek/Cabinet Gorge area in February 1971, (2) one bull (?) along the North Fork of the Flathead River in May 1981, and (3) tracks and some hair samples in the Ten Lakes area in May 1982.

On March 26, 1983, the Kootenai National Forest paid the Department of Fish, Wildlife and Parks over $600 to survey caribou in the Ten Lakes Wilderness Study Area east of Eureka. An eight-hour, one-day survey was made, with a helicopter pilot and an observer who together had over 30 years of big game censusing experience.

The observer was briefed before the survey by a Forest Service biologist familiar with the Selkirk caribou. The survey included most of the likely habitat (from 5,500 feet up) in the Ten Lakes Basin, the Wigwam drainage, and east to Tuchuck Mountain. In all, over 100 linear miles were flown. No caribou or caribou sign was observed, but several likely patches of old-growth spruce, subalpine fir, and whitebark pine were noted.

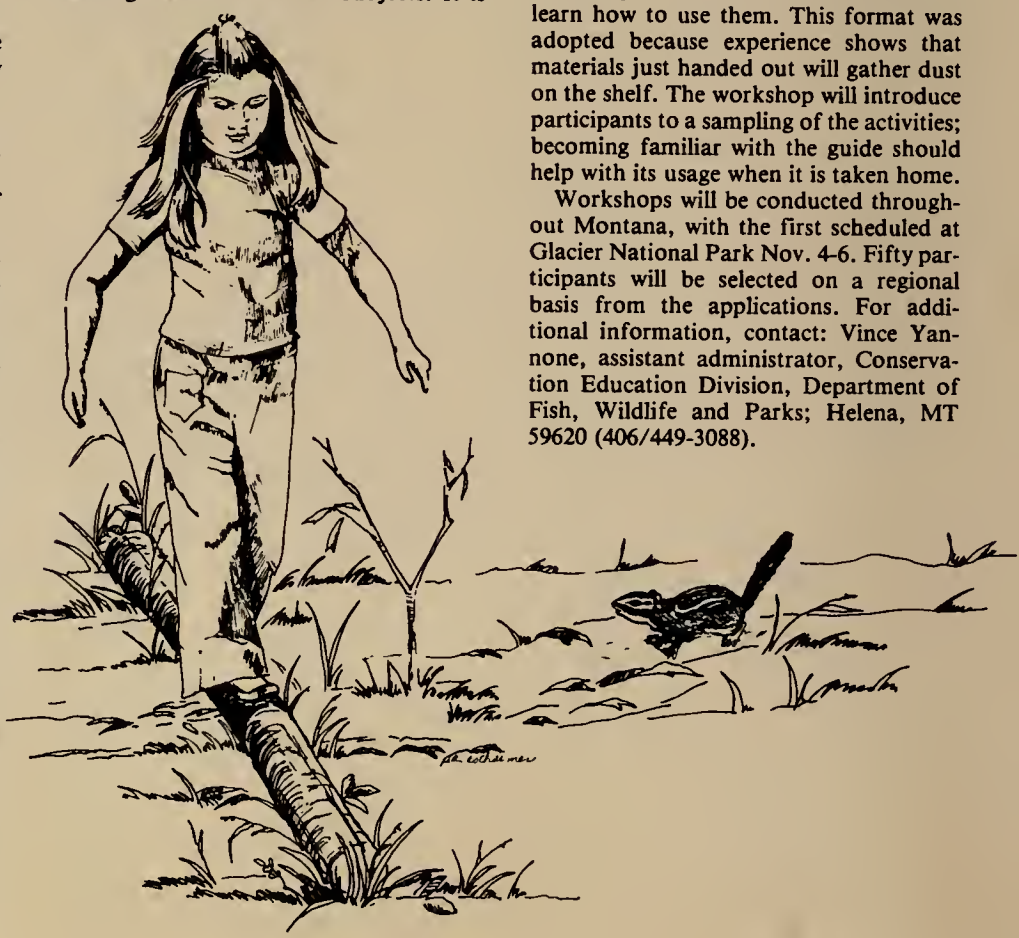
The Kootenai National Forest is continuing to check some of the better caribou habitat, with the department following up on promising reports. Both agencies are considering another flight in March 1984, when the state's helicopter will be in the area for an annual elk survey.—*Mike Aderhold, Region 1 (Kalispell) information officer*

Project WILD Takes Off

Project WILD is a new and creative educational program developed to teach wildlife in schools. After three years of hard work by a dedicated group, a curriculum guide for teachers has been put together that can be integrated into all school subjects.

The guide is an attempt to provide a program of action with 150 activities for different grades. Some of the activities are designed for the classroom, while others are to be completed outdoors.

The guide is designed to teach basic concepts of wildlife while the student is learning traditional school subjects. It is unique because state educational departments and state wildlife agencies worked together to develop it. Because of this cooperative effort, children in schools and those in other educational programs will have an opportunity not only to learn about, but also to experience, their environment and its wildlife.



Enhancement and enrichment of traditional curricula is Project WILD's strategy. Use of an outdoor laboratory is stressed for those activities where the environment itself is the most effective place for teaching. But Project WILD provides only a guide. The teacher might want to use all or only a few of the suggested activities. They also can be improved by the classroom teacher.

The activity itself is most important. The teacher can adapt it for grade level or ability of individual students and may find a better way to introduce or teach the subject matter.

For conservation to be truly effective, its principles must become a part of everyone's thinking. The guide has attempted to do this by introducing all school children to wildlife principles and practices through everyday activities.

The guide will not be available just for the asking. Educators and others interested must attend an introductory workshop to obtain the materials and to learn how to use them. This format was adopted because experience shows that materials just handed out will gather dust on the shelf. The workshop will introduce participants to a sampling of the activities; becoming familiar with the guide should help with its usage when it is taken home.

Workshops will be conducted throughout Montana, with the first scheduled at Glacier National Park Nov. 4-6. Fifty participants will be selected on a regional basis from the applications. For additional information, contact: Vince Yannone, assistant administrator, Conservation Education Division, Department of Fish, Wildlife and Parks; Helena, MT 59620 (406/449-3088).

Indictments Result From "Sting" Operation

MIKE GURNETT

They are accused of offering the most prized trophy animals in the Rockies. For prices from $2,500 to $20,000 depending on the animal, a kill was guaranteed. How could a hunting "business" make such a promise? By guiding clients onto public land after the fall hunting season is closed, when big game animals are at lower elevations and are much less wary.

Thanks to undercover agents for the U.S. Fish and Wildlife Service (USFWS) and wardens with the Montana Department of Fish, Wildlife and Parks, the "business" abruptly went out of business. Six people from Colorado and one from Montana were indicted on violations of the Lacey Act, involving conspiracy and interstate transport of illegally taken wildlife. Each count is punishable by a maximum fine of $20,000 and a maximum prison term of five years, or both.

Undercover federal investigators who acted as hunters in a "sting" operation to break up the poaching ring praised the work of DFWP Warden Chester Lamoreux, Thompson Falls. His initial investigations led to use of USFWS undercover agents to reveal the ring's activities, which spread across a multistate area. The indictments followed an 18-month investigation into what is described as one of the largest poaching operations in the history of the region.

Records from the 14th Judicial District Court of Colorado accuse Jerry Marjerrison of Plains, Mont. on specific counts of transporting, storing, and shipping an illegally killed bighorn sheep; illegally killing a black bear and participating in killing another black bear and transporting it, and guiding USFWS undercover agents during night hunts for white-tailed and mule deer, while using spotlights. State charges have also been filed.

A 21-page affidavit details numerous other hunts involving the killing of bighorn sheep, elk, white-tailed and mule deer, and bear. Special agents and wardens said hundreds of trophy big game animals had been killed by the poaching ring, the carcasses stripped of antlers and horns, and the meat left to rot.

During a search of the Marjerrison property, law enforcement agents from the USFWS and the DFWP seized 196 pieces of evidence—many rifles and knives, 30 sets of antlers, photographs and records, and two vehicles. Department personnel involved in this search included Lamoreux; Louis M. Kis and Floyd Thomas, Kalispell; Bill McKiernan, Bob Bird, and Jack Ballard, Helena; Elmer Davis and Jeff Scott, Billings; Dale Graff, Miles City, and Gary Burke, Libby.

Because of ongoing court proceedings, specific details of this case are unavailable. A more complete report will appear in a future issue of *Montana Outdoors.*

Book Reviews

HUNTING DOG KNOW-HOW, by David Michael Duffey, Winchester Press, 220 Old New Brunswick Road; Piscataway, NJ 08854, 1983, 208 pages, $8.95.

This revised edition of Dave Duffey's classic book is a must for anyone contemplating the purchase of a first gun dog. While designed primarily for beginners in the mysterious art of gun dog training, the book is a handy reference for those with experience as well. The early chapters describe the characteristics of each breed and how best to match the breed to the type of hunting you want to do. The remainder of the book is devoted to training methods for each of the three broad groups of gun dogs: retrievers, spaniels, and pointers. It also contains a section on special problems sometimes encountered in the course of transforming a gangly pup into a polished performer.

Shelves of books have been written on the subject of gun dog training. Many of these have been written by people who are better writers than they are dog trainers, a fact which shouldn't be too surprising. After all, how many people work with gun dogs day in and day out, observing the various breeds and the tremendous individual variation within each breed, until they can speak with confidence about dog behavior and training? Only a handful of professional dog trainers, and most of them can't (or don't) write a lick.

Dave Duffey is an exception. A professional trainer, handler, and guide, as well as an accomplished writer, he has owned, trained, or hunted over hundreds of dogs. He understands the amateur's problems and gives advice that can be trusted, and he does it in a down-to-earth style that you'll find entertaining as well as informative. If you followed Duffey's hunting dog column in *Outdoor Life* a few years back (he was dog editor for two decades), or if you read his current questions and answers column in *Gun Dog,* you need no further introduction.

The book is liberally sprinkled with black-and-white photographs that help drive home important points. It's a good buy at $8.95.—*Dave Books*

NYMPH FISHING FOR LARGER TROUT, by Charles E. Brooks, Winchester Press, 220 Old New Brunswick Rd.; Piscataway, NJ 08854, 1983, 184 pages, $8.95, soft cover.

The first edition of this book, published in 1976, quickly became a favorite of trout fishermen across the country. This reprint, graced by Dave Whitlock's fine drawings, should prove just as popular. Nymph fishing is a difficult and demanding fly-fishing technique, but extremely rewarding for those who have the perseverance to master it. To use nymphs effectively, one must know not only the fishing technique, but also the stream biology. As Charles E. Brooks says in his introduction, "One *must* know what the

major nymphs are that inhabit the stream he fishes, and he must know in what water and bottom types the particular insect he wishes to imitate may be found."

"Nymph Fishing for Larger Trout" will tell you how to obtain that information firsthand, how to select the most effective patterns, and how to fish with nymphs. Chapter 17, "Nymphing for Larger Trout," will be of special interest to Montana fishermen, since Brooks has done much of his "research" on the large trout inhabiting Montana streams. A retired Air Force major, Brooks resides in West Yellowstone, Mont.—*Dave Books*

Hunters, Fishermen—Share Your Sport

Remember the excitement of catching your first fish? Hitting the bullseye or breaking a clay target for the first time? Your first sunrise in a duck blind? Those are memories every sportsman can treasure for a lifetime.

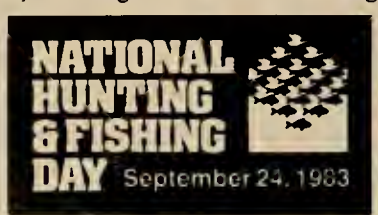
This year's theme for National Hunting and Fishing Day, "A Day for a Lifetime," highlights the fact that the only thing that separates many people from having the same excitement you have enjoyed is that they have never been exposed to it.

By giving a day to participate in National Hunting and Fishing Day—Sept. 24, 1983—hunters and fishermen can open the way for non-sportsmen to have a lifetime of enjoyment outdoors.

National Hunting and Fishing (NHF) Day also helps to ensure a healthy future for hunting, fishing, and the outdoors. Through exhibits displayed at NHF Day programs, non-sportsmen can learn about the need to conserve our natural and wildlife resources and how hunters and fishermen make important contributions to America's conservation efforts.

A wide variety of activities mark National Hunting and Fishing Day each year. "Open houses" may be sponsored by a single sportsmen's club and attract a few dozen people. In other areas, sportsmen's clubs may join together with conservation organizations and civic groups to sponsor an NHF Day; exhibits and demonstrations in a shopping mall or county fairgrounds may attract thousands of people.

National Hunting and Fishing Day has earned the support of more than 40 of the nation's leading conservation organizations, including The Izaak Walton League and the National Wildlife Federation. Each year, more than 2,000 separate National Hunting and Fishing Day activities are attended by more than 10 million people.



The success National Hunting and Fishing Day has in reaching the public each year depends on the support of the nation's hunters and fishermen. Every individual—and every club—that participates makes a difference.—*Bob Davis, NHF Day coordinator, National Shooting Sports Foundation*

Tribute to P.D. Skaar

Bird-watchers and ornithologists lost a leader and a friend this spring with the death of Dr. P.D. "Dave" Skaar, professor of genetics at Montana State University, Bozeman. Dr. Skaar, 60, died suddenly of a heart attack on March 30 in Salt Lake City.

Prof. Skaar joined the faculty at Montana State College (now MSU) in 1957, where he founded and directed the Genetics Institute. During his career, he wrote widely in the field of microbial genetics.

In Montana, Prof. Skaar will perhaps be best remembered for his contributions to the study of bird distribution. He was the author of "Birds of the Bozeman Latilong" and "Montana Bird Distribution." At the time of his death, he was working on the third edition of "Montana Bird Distribution." A lifelong bird-watcher, he coined the word "latilong" to describe a geographic area bounded by one degree of latitude and one degree of longitude. Use of the latilong concept in distributional studies of birds and other species has been widely adopted by the scientific community.

He will be missed by his many friends and colleagues, but will be remembered by many as one of Montana's leading ornithologists.—*Dennis Flath, nongame biologist, Wildlife Division, Bozeman*

If You Aren't Sure Of Your Target—DON'T SHOOT

Your safety, the safety of others, your hunting success, and even the opportunity to hunt depend on heeding this advice. It is taught in every hunter safety class, and it is one of the responsibilities you accept when you go to the field to hunt.

Despite this, every fall people are injured or killed because they are mistaken for game. Every year, young moose are mistaken for elk, elk for deer, or whitetails for mule deer and vice versa. Sometimes during waterfowl season, relatively rare canvasbacks and redheads are mistaken for mallards, and swans for snow geese. This spring, at least two and perhaps four grizzlies were mistaken for black bears.

These mistakes shouldn't occur. You shouldn't shoot unless you're sure of the target. Certainly, game identification can be difficult. Animals do not always reflect the coloring common to or typical of the species. Size can vary, and an individual can be much larger or smaller than normal. Location is not a distinguishing characteristic; moose, elk, bears, and mountain lions have all been seen in recent years hundreds of miles from their normal ranges.

Montana's hunting regulations assume a basic understanding of the characteristics of the various game species and a common knowledge of the published regulations. There is no excuse for ignorance.

Hunting regulations are available from over 400 license agents across Montana and at all offices of the Department of Fish, Wildlife and Parks. Books and pictures of Montana game animals are available at every library and every library outlet in Montana.

Every game animal has at least four characteristics that distinguish it from any other game animal, and one must always consider the combination of these characteristics. Sometimes one characteristic—like color, or antlers, or claws—may not be well-expressed in a very young, very old, or injured individual.

Light conditions, weather, temperature, surrounding colors, distance, and one's physical health all influence perception. Hunting and outdoor experience and level of concentration and excitement likewise influence vision.

There is no greater quality in a hunter than patience. Wait for a better view. Get closer. Come back the next day. Don't be tempted to take a chance. In a lifetime of hunting, you'll have plenty of opportunity.

If you aren't sure of your target—don't shoot.

Sodbusting in Montana:

A 1980s DUST BOWL?

APRIL 18, 1981: Angela, Montana. The warm wind grew stronger and brisker. Little by little, the sky was darkened by choking clouds of billowing dust. The wind raced over the plowed fields, loosened the topsoil, and lifted the finer particles into the air. As the day advanced, the wind increased, raising dirty plumes high above the fields. There was a biting sting in the air and the wheat stubble shook violently as the wind cried and whimpered over the parched ground. An enormous wall of dirt blotted out the sun's dim red circle and halted traffic on State

by Ken Walcheck

PHOTO: KEN WALCHECK

Highway 22 in the Angela area, 28 miles northwest of Miles City.

"Angela blew by last night," was the first sentence in a letter to the editor of the Miles City Star the day after the storm. Written by a downwind resident of Terry, the letter expressed indignation and dismay over the loss of precious topsoil from the Angela plowout, a 20,000-acre chunk of fragile, prairie grassland that had been plowed in 1976 and 1977, and then block farmed.

It seems to take a disaster of this sort to make people realize there's a problem on their doorstep. We should have learned an unforgettable lesson from the "dirty '30s," but the human memory is sometimes woefully short. There are parallels to what happened during those Dust Bowl years and what is now happening in some parts of the country.

From 1926 to 1931, there was hardly enough rain to settle the dust. During the summer of '31, farmers gazed into cloudless skies where a relentless sun beat down from dawn till sunset. Topsoil turned to powder, and grain that mustered enough moisture to germinate turned to chaff before it developed a head. In the spring of '34 and again in '35, blast-furnace winds of gale strength sent soil flying skyward in black clouds that grew thicker every day. During May of 1934, a major wind storm battered the plains. That storm was later described by Hugh H. Bennett, first director of the Soil Conservation Service (SCS), as a turning point in arousing public awareness of the problem:

> This particular dust storm blotted out the sun over the nation's capital, drove grit between the teeth of New Yorkers, and scattered dust on the decks of ships 200 miles out to sea. I suspect that when people along the seaboard of the eastern United States began to taste fresh soil from the plains 2,000 miles away, many of them realized for the first time that somewhere something had gone wrong with the land....it took that storm to awaken the nation as a whole to some realization of the menace of erosion.

There is a postscript to the story of the Dust Bowl worth remembering: Land cannot be abused without consequence.

RICHARD L. FURBER

Sodbusting (above), the plowing of fragile grasslands and other marginal soil for conversion to unsuitable cropland, leads to erosion and other problems. Yet, this practice continues—in Montana and elsewhere. Nationwide, we lose about 5 billion tons of topsoil to erosion each year. Erosion results in blowing soil, which has partially covered this fencerow (below) on U.S. Highway 2 between Wolf Point and Poplar.

RICHARD L. FURBER

In 1980, former Secretary of Agriculture Bob Bergland estimated that more than 10% of the land under cultivation in the United States was eroding at unacceptably high levels—more than 14 tons of soil per acre per year. Nationwide, we annually lose about 5 billion tons of topsoil to erosion, according to the SCS. Only 2 billion tons were lost in 1934—the worst year of the Dust Bowl. In Montana, about 7% of the cropland undergoes an annual erosion rate of more than 14 tons of soil per acre per year. The SCS erosion report for March through June of 1983 estimates that 360,000 acres of Montana's croplands were damaged from wind erosion. Blaine County led the state with over 84,500 acres damaged.

"How can this be possible?" you might ask, especially when Americans vowed "Never again!" after the Dust Bowl era. What about conservation programs? And how about sophisticated agricultural systems, farm policies, and other conservation incentive programs? Concerned citizens, from congressmen to farmers, are now asking these questions. "Part of the answer," wrote R. Neil Sampson in his book, "Farmland or Wasteland," "is that conservation programs had been working, but on a very low level of funding and activity. While the task of protecting farmland had been growing more and more difficult, the amount of money directed toward the task had actually been shrinking in purchasing power....The 'farm problem' facing national policy makers rested not on the fact that U.S. agriculture didn't work, but that it worked too well."

The "too well" part of the equation focused on: increasingly better farm technologies, intensified farming, an expanding global market, government subsidy payments, and favorable weather patterns. All of these factors—and others—combined to lure some people into maximum output for quick profits, conservation efforts be damned. Runaway inflation, surplus crop yields, international political changes, petroleum supply disruptions, and falling commodity prices further complicate the agriculture-erosion equation.

This past May, I flew over the Crow Rock plowout north of Miles City that will be block farmed for winter wheat. Looking at more than 70 square miles of plowed turf from the air is mind boggling. Your eyes ricochet east, west, north, south. As you spot the huge four-wheel-drive tractors kicking up dust, you can better appreciate how new farm technologies—all designed to substitute capital, petroleum, fertilizers, or technology for labor—have made many conservation practices obsolete, without providing new techniques to replace the old.

Despite what is known about the farm problem, the plowing of fragile grasslands—usually in tracts of several thousand acres—in Montana and elsewhere continues. In Montana, 749,822 acres of grassland were converted to non-irrigated cropland between 1977 and 1982, according to the "Report of the State Department of Revenue" which is furnished to the governor and Legislature every two years. Currently, the state has about 21 million acres of unplowed, highly erodible marginal grassland. Nobody knows how much of this will be up for grabs in the future. Also, no one knows how many non-family corporations are operating in the state or how much non-irrigated cropland

they control. One such corporation has reportedly plowed out more than 150,000 acres of rangeland in the state.

Recent large-scale sodbusting of fragile grasslands in Montana includes the 50,000-acre Crow Rock plowout (Garfield and Prairie counties) and the 60,000-acre (in progress) Winnett plowout in Petroleum County. Although soil capability classes (the SCS groups soils into eight capability classes, the risks of soil damage or the limitations in use becoming greater from Class 1 to Class 8) have not been completely mapped for the two plowouts, much of the land is in Class 4 and sizable portions are in Classes 6 and 7, which the SCS considers as having severe limitations that make them unsuitable for cultivation. The majority of the state's cropland is considered Class 3—soil that is erodible, but still farmable. Conservation methods, such as strip cropping and stubble management, must be used on such soil.

"Soils in Class 4 have severe limitations that require intensive management," says Dennis Loreth, Forsyth-based district conservationist for the SCS. Loreth is concerned with soil erosion problems on some of the large block-farmed plowouts in which the operators use continuous cropping instead of strip cropping or other semiarid conservation practices which grew out of the sad experiences of the Dust Bowl era.

"One major wind storm battering a large block-farming unit, such as the 31 square-mile Angela unit, can remove as much as 15 tons of topsoil an acre or more," stresses Loreth. The 1981 dust storm which introduced this article attests to the validity of Loreth's statement. In Kiowa County, Colorado, an estimated 150 tons of soil per acre were lost in one huge dust storm in February 1977.

So why does sodbusting continue? If thousands of farming operations are folding each year because of inflation, depressed markets, high operating costs, and high interest rates, what are the incentives for continuing to break more land?

Part of the answer lies in the difference between grassland and cropland prices. In the semiarid West, dryland cropland is priced at about double what the same land is worth with only grass for cattle. The monetary difference is a major incentive for an investor to increase the land's value by converting it to cropland, even though a continuous cropping system may produce marginal (or poorer) yields.

The investor or corporation buying, plowing, and reselling the land also takes advantage of U.S. tax laws and tax shelters. Costs of breaking and seeding the land are tax deductible. While the value of the land may double just because it has grown a couple of grain crops, the increase is "capital gain," and only 40% of the profit is taxable.

The shrinkage of wildlife habitat from plowouts is a direct and unmitigable loss to wildlife....Shortgrass prairie and its wildlife inhabitants represent the end point of millions of years of evolution and it can't be restored overnight, if in fact it can be restored at all.

Federal subsidy programs also encourage sodbusting. According to the July 25, 1983 issue of *Newsweek*, "...government subsidies to farmers will explode to $21 *billion* this year. Even more amazing is that those subsidies will just about equal the total earnings of American farmers this year...." Some people believe that government price support programs provide a big incentive to sodbusters and are instrumental in maintaining the disparity between grazing and cropland prices which encourage plowout.

What are some of the subsidy programs that encourage plowouts? On Dec. 22, 1982, the Great Falls Tribune published an informative article, "Disappearing Topsoil Forming Grim Clouds?" written by T.J. Gilles, managing editor of the Record Stockman of Denver. Gilles listed some of the benefits for which qualified persons are eligible. I have updated and expanded his list:

• Government price support programs. To be enrolled in a support program such as the Acreage Reduction Program (ARP), a farmer must have established a wheat base (two-year cropping history) and must agree to take 20% of his grain land out of production. By doing so, the farmer is entitled to deficiency and diversion payments. An individual or corporation can collect up to $50,000 a year in price support deficiency payments from the Agricultural Stabilization and Conservation Service. Before the disaster payment program was modified two years ago, producers could collect up to $100,000.

Here's how the ARP works: For 1983, the U.S. Department of Agriculture's (USDA) national target price for wheat has been set at $4.30 per bushel. If the national average price of wheat (a quoted price determined from 40 grain elevators in the country for a five-month period) falls below $4.30, a producer can be reimbursed up to a maximum of 65 cents per bushel in deficiency payments so the target price is still achieved.

Farmers are also entitled to diversion payments. The government will pay $2.70 per bushel per diverted acre on another 5% of the wheatbase acreage that has been established.

• Grain that isn't sold can be put into the "farmer-held reserve" with a commitment to keep it there for three years, plus the government pays 26½ cents per bushel for the storage.

• Wheat the farmer doesn't sell can be mortgaged to the government at the above market value level of the national loan rate ($3.65 per bushel), or higher, if it's tied up in the farmer-held reserve.

• As a special enlistment bonus, farmers can obtain one-half of their estimated deficiency and diversion payments as soon as they sign up.

• Before the disaster payment program was modified two years ago, producers could collect up to $100,000. Now, under the 1980 Federal Crop Insurance Corporation (FCIC) program, the government normally pays 30% of the premium and the producer the rest. Once insured, you are guaranteed a certain amount of production per acre. Three

selections of coverage—50%, 65%, or 75%—of the average crop yield calculated for the farm or area are available to eligible producers. FCIC has recently tightened its crop insurance regulations in several areas, especially that of crop coverage on marginal lands.

Block farming without built-in accepted conservation practices would be an example of poor erosion control and one that would not qualify for FCIC insurance.

With such financial incentives, it is no wonder that plowouts are proliferating. Is there anything that can be done about it? Slowing down plowouts on Montana's fragile grasslands can be accomplished in two ways: federal legislation, and land-use regulations implemented at the county level. Let's look at the federal scene (as this magazine went to press) first. Three separate House and Senate bills currently in the hopper provide that farmers breaking up Class 4 land or worse cannot participate in specific federal programs. The so-dubbed "sodbuster" bill, sponsored by Sen. William L. Armstrong (R-Colo.), aimed at controlling soil erosion, would prohibit payment of government price supports, crop insurance, disaster payments, Farmers Home Administration (FmHA) loans, and Farm Storage Facility loans on crops grown on newly plowed fragile lands. The bill, S.663, would not apply to land already planted or acreage plowed before the day of enactment. The measure also would not apply to lands where erosion is not a problem and where local conservation districts could approve conservation plans whereby exemptions could be made for lands not erosion-prone. The House version of Armstrong's bill, a carbon copy, is sponsored by Rep. Hank Brown (R-Colo.).

Sen. Max Baucus (D-Mont.), cosponsor of Sen. Armstrong's bill, maintains that some congressmen want to make the sodbusting proposal retroactive by denying payment to farmers breaking up marginal land in the past. However, Sen. Baucus points out such action may be unconstitutional and may jeopardize the chances of the legislation passing.

Rep. Ron Marlenee (R-Mont.) is sponsoring a sodbuster bill that would cut off price supports, disaster payments, and storage facilities for plowing marginal land. The bill differs from the others in that sodbusters breaking marginal land after Jan. 1, 1983 would still be eligible for FmHA loans and FCIC coverage. The bill also authorizes the USDA to compensate farmers for setting aside erodible land they are now farming.

Numerous agricultural, conservation, and environmental groups in the

KEN WALCHECK

KEN WALCHECK

Antelope and other wildlife are affected by plowouts such as the one at Angela (above), 28 miles northwest of Miles City. This 20,000-acre chunk was plowed in 1976 and 1977, and then it was block farmed. Recent large-scale sodbusting of fragile grasslands in Montana (below) includes the 50,000-acre Crow Rock plowout in Garfield and Prairie counties.

state have gone on record opposing plowouts. Many, such as the Montana Farmer's Union, have passed resolutions deploring the subsidy of marginal farming operations: "Congress should seriously consider curtailing subsidies and tax breaks which encourage absentee owners to engage in destructive farming practices," the Farmers Union resolution reads.

"It was never intended that the federal farm programs assist land speculators, absentee owners, and foreign investors who destroy both the family farming concept and neglect accepted conservation practices," the resolution continues. The Farmer's Union is right on target. A flurry of realistic legislation will certainly focus more attention on the issue.

On the state agency level, the Department of State Lands has a two-year moratorium on all breaking (with minor exceptions) of state sections. The moratorium was enacted because of concerns over the national grain surplus.

Such is not the case in other states, Colorado for example. In June 1982, a comprehensive report, "Pueblo County, Colorado, Fragile Grasslands Conversion Study," was prepared for the Pueblo County Board of Commissioners. One section of the report centers on factors contributing to the conversion of fragile grasslands to non-irrigated cropland, including the value differential on state land assessment practices. In reference to state lands, the report reads: "A May 5, 1982, article in the Denver Post regarding the State Board of Land Commissioners' action to permit the plowout of 1,320 acres of grassland leased from the state highlights this differential. The state has been receiving 75 cents per acre for the land leased for grazing, which generated an annual revenue of $990. Upon the board's decision to allow the plowout of the land, the lease fee increased to $12.62 per acre, or $16,658 annually. This difference could encourage the plowout of land purely on a speculative basis."

There is also the controversial issue of voluntary versus regulatory programs that are debated and cussed at every turn when the subject of land-use regulations comes up. The majority of the farmers I have talked to seem to count their blessings that they are not encumbered with governmental regulations, like those of other private sector industries.

"As a diversified farmer, I want to be able to manage my land the way I want to," said Jack Deibel, Volborg rancher, at a Montana Stockgrowers Association meeting in Great Falls this past June.

"But at the same time" he added, "I don't want to live next to a 50,000-acre block that's been broken up and have my fences buried [from wind-eroded soil] every spring."

The implications are clear. Given the option, a majority of farmers favor voluntary programs, except when someone else's negligence is causing them serious harm. If regulation is needed, most farmers prefer that it be administered locally and as a last resort.

There is a postscript to the story of the Dust Bowl worth remembering: Land cannot be abused without consequence.

On the other side of the fence, Forsyth rancher Bill Gillin has other thoughts on regulatory law. In a letter to the editor of the Miles City Star, Gillin wrote:

> As soon as any legislation is proposed, the people who are so deeply involved in this plowout will begin waving the flag and claiming they have a constitutional right to do what they wish with their land. What they will ignore are two Supreme Court decisions that do put limits on those rights. One is Justice Oliver Wendell Holmes' famous decision stating in effect that yes, the individual does have a right to swing his fist, but that right ends where the other fellow's nose begins. If my fences were to be blown under, my stockwater reservoirs to be silted full, and my springs covered with silt, then I would think the other fellow had swung his fist too far. The other decision is of more recent vintage, but quite to the point: "What the government subsidizes, the government has the right to control."

In the Winnett area, local residents felt that the neighbor's "right to swing his fist" had gone a hair too far, and steps were taken to initiate local land-use regulations. Under Montana law, conservation districts can impose land-use regulations if approved by a public referendum. If a proposed county land-use ordinance is enacted, it would be the first of its type in Montana. Their concern is focused on a farmer-speculator who had purchased two large ranches in Petroleum County, totaling more than 66,000 acres of deeded and leased land. Sodbusting crews, utilizing 13 tractors, and working around-the-clock, had busted about 22,000 acres (at the time of this writing) before a public meeting was finally conducted to discuss the issue. Some local residents feared the plowout would come back to haunt adjacent landowners and others in Dust Bowl proportions. Their concern focused on eroded soil that could be converted into a liability through human neglect. A liability in the sense of saline seep problems, wind-blown soil, and Russian thistles burying fences and borrow ditches and silting in reservoirs such as Petrolia, a source of irrigation water.

Only rarely have mandatory land-use guidelines been passed at the local level. Colorado is one good example. High grain prices in 1973-74 brought outside investors to marginal areas such as the southeastern part of the state. Cheap rangeland was purchased, plowed, and block farmed. Money was pocketed during a couple of good growing years, then the land was sold when the price of wheat dropped. Today, much of that land is growing Russian thistles or marginal wheat crops.

Colorado has taken the approach that the plowout issue is best handled at the local level because conditions and the severity of the problem vary greatly throughout the state. The ability of counties to pass ordinances controlling the plowout of fragile grasslands is authorized under the "Land Use Control Enabling Act of 1974." Last year, Weld County Commissioners passed the Weld County Fragile Grasslands Ordinance barring plowouts without approved conservation plans. At this writing, four other

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THE MORNING AIR has a hint of autumn in it these days, and the elk are already bugling in the high country. If you're like a lot of Montanans, you'll soon be thinking about sighting in your rifle and getting your freezer ready for a fresh load of elk steaks. (Well, you aren't absolutely sure about those elk steaks, but it doesn't hurt to be optimistic.) One thing you *are* certain of is that you'll have ample opportunity to hunt elk this fall, since Montana's general elk season is long and liberal.

But what's this talk you've been hearing about branch-antlered bull seasons? Will elk hunting regulations be changing, and if so, why? Are Montana's elk herds in trouble, making it necessary to impose new restrictions on hunting?

There are no simple answers to these questions. In general, Montana's elk herds remain healthy, but the state's elk habitat is not faring as well. Steadily increasing access and decreasing cover—mostly due to logging—coupled with increases in hunters, four-wheel-drive vehicles, and leisure time have resulted in reduced elk security and more pressure on elk populations. In some districts, the chances of taking a trophy bull are almost non-existent.

Well, you say, that's easy to remedy. Restrict the harvest of bulls in those districts to branch-antlered animals only, and in a few years we'll have lots of elk, including some big bulls, running around the hills again. Right?

Unfortunately, the solution isn't quite that simple. Changing the hunting regulations will not restore lost habitat and elk security. Because security is an integral part of elk needs, the fate of elk hunting in many parts of Montana is in the hands of the *habitat* managers, primarily the U.S. Forest Service. When escape cover is limited, hunting pressure becomes a problem. Road closures are one means of increasing the level of elk security, and that's why the Department of Fish, Wildlife and Parks has adopted a road management policy (see "The Forest Road Issue," *Montana Outdoors,* Nov./Dec. 1982).

Thus, simply imposing a branch-antlered bull season in an area where inadequate elk security is the real culprit is not likely to result in improved

LOUIS M. KIS

Branch-Antlered Bull Seasons: ON THE HORNS

hunting opportunities—at least not for the reasons commonly believed. But branch-antlered seasons do bring about some changes, both in elk population structure and in elk availability, and these changes have important ramifications for you, the hunter. It is important that you understand these changes, so you can voice your opinions in future deliberations concerning elk hunting regulations.

First, let's look at the purely biological considerations. The number of elk available, the age and sex structure of the elk population, and the type of habitat all dictate the best type of season for any given area. A branch-antlered bull season, obviously, is sex- and age-specific, and implemented primarily to restrict the harvest of spike (yearling) bulls.

In some portions of Montana, such as the Gravelly Mountains in the southwestern part of the state, a shortage of cover, easy road access, and heavy hunting pressure have resulted in a high rate of elk harvest. Most of the bulls harvested are spikes, and few bulls are left in the herd following the hunting season. Surveys on the winter range in this area have shown very low calf crops in recent years (in 1980, only 17 to 22 calves per 100 cows), and many small, poorly developed calves.

Although we do not have conclusive proof, we think the poor calf production in this area stems from the scarcity of mature bulls in the population. Research in Oregon on elk in captivity has shown that although spike bulls do breed, they tend to breed later and are usually less successful, thus their offspring tend to have greater mortality than the offspring of older bulls (see Table 1).

HARRY ENGELS

OF A DILEMMA

by Glenn L. Erickson

Also, cows bred late by yearling bulls may continue to breed late in subsequent years, due to the fact that their calves are not weaned until later. Although this has not been documented scientifically for free-ranging elk in Montana, biologists generally agree that it is more desirable to have the majority of breeding done by mature bulls.

For this reason, beginning in 1981, we implemented a branch-antlered bull season in the Gravelly Mountains to allow more yearlings to survive the hunting season. Those yearlings were 2½-year-old bulls during the 1982 breeding season. If yearling bull breeding was the cause of the low calf crop in 1980, we should begin to see an improvement in the calf ratios this year. Since weather conditions and other factors also influence the survival of calves, it may take two to three years to fully evaluate the effect of the branch-antlered season on calf production and survival. Thus, branch-antlered bull seasons implemented because of very low bull numbers and low calf crops may benefit the sportsman through improved productivity of the herd.

Where herd productivity is *not* a problem, branch-antlered bull seasons may have some effects on the elk population which, from the hunter's standpoint, may be less desirable. When spike bulls are not harvested, there will be a larger number of spikes on the winter range than when spikes are harvested. Because most of our elk winter ranges are now supporting the desired number of elk, an increase in spikes on the winter range will in all likelihood necessitate a decrease in cows and calves. For example, if a winter range will support only 100 elk, you can have 30 bulls and 70 cows and calves, or you can have 10 bulls and 90 cows and calves. But to maintain the quality of the range, the total herd must be limited to 100 animals.

Thus, in the first few years of a branch-antlered bull season in a situation where herd productivity isn't the issue, hunters will likely notice an increase in antlerless elk permits to reduce the cow/calf segment of the population. Eventually, because of fewer cows in the herd and fewer calves produced, the total harvest will be lower than that achieved by a general bull elk season—which leads us to the other part of the elk management equation: the question of hunter satisfaction.

Hunters go afield for many reasons. In an Arizona study, hunters were found to have complex motives, including the desire to stay physically fit, to get out and enjoy nature, to be with family and friends, to procure food, to successfully meet the challenge of bagging an elk—even character development and religious beliefs were mentioned. Most hunters have an "ideal" fixed in their minds of what constitutes a successful elk hunt. To some, it may be no more than getting out in the mountains to enjoy the fall weather and scenery. To others, it may be a "wilderness" escape where few other hunters are encountered. To some, it is the stalk and the well-placed shot that make the hunt. Some people aren't satisfied unless they've filled the larder, while others consider the annual camaraderie with old friends reward enough. Some hunters want a chance to shoot a trophy bull or just to know one is out there, while others judge success not by the age or size of the elk, but by the quality of the hunting experience. In the Fleecer Mountains area of Montana, a 1979 survey of elk hunters indicated that 72% hunted equally for recreation and meat. The survey also indicated that regardless of the reason for hunting, the "first legal elk seen" was still the predominant choice of most hunters.

Thus, the question of branch-antlered bull seasons is hotly debated by many of Montana's hunters. Some feel that the state's rich elk hunting tradition will be badly compromised if there is little or no opportunity to bag a mature bull. These hunters are

willing to accept more stringent elk hunting regulations (e.g., branch-antlered seasons, shorter seasons, etc.) and additional road closures if these regulations will ensure the presence of trophy bulls in the population.

But will implementation of a branch-antlered bull season result in more trophy bulls in the population? Let's look again at the Gravelly Mountains situation. During the first year of a branch-antlered bull season, one can assume the harvest of bulls will drop considerably. In the Gravelly Mountains (Hunting District 324), hunter success and hunter days both decreased in 1981 (from 14% in 1980 to 9% in 1981, and from 8,400 to 7,000 days, respectively). During the second season, however, hunters will normally see and harvest more branch-antlered bulls (mostly 2½-year-olds). In 1982, hunters in the Gravelly Mountains bagged more than twice as many branch-antlered bulls than in 1981, and hunter days increased to 8,900.

Naturally, when the pressure shifts to the branch-antlered bull segment of the population, the harvest shifts from primarily spikes to primarily 2½-year-old bulls. Thus, in the Gravelly range we still haven't satisfied the desires of those hunters who want trophy bulls in the population—we've only delayed the age at which most bulls are harvested by one year. The culprit, once again, is *diminishing elk security*—no amount of fine-tuning the elk hunting regulations can atone for the basic problems of habitat loss and increased hunter access. What the branch-antlered bull season *will* do—we believe—is improve the herd productivity through higher calf production and survival. If we wish to manage for trophy bulls in the Gravelly range, further restrictions will be necessary.

What will branch-antlered bull seasons accomplish in areas with good escape cover, limited access, and low to moderate numbers of hunters? In such areas, it is probable that more 2½-year-old bulls will survive the hunting season, and thus a greater percentage of larger bulls will be present in the population in years to come. But remember, one of the effects of a branch-antlered bull season where reproduction is not a factor may be replacement of spike bulls for cows and calves on the winter range, which can eventually lead to a lower total harvest than would have been possible with a general bull season.

How much lower might this harvest be? While we don't have any data for Montana, we can look at data from a study done in Colorado (See Fig. 1). This study compared the elk harvest levels for a general bull season (any antlered bull was legal) and a branch-antlered season (four points or more). While the harvest in the area with the branch-antlered season included 96 more "trophy" bulls than the general season area, 373 fewer elk were harvested overall. Although Montana conditions may differ from Colorado's, hunters are likely to see a reduction in total harvest as a result of branch-antlered bull seasons in areas where elk populations are limited by winter range carrying capacity or other factors and where reproduction is not a problem. Some hunters may be satisfied to see more branch-antlered bulls—perhaps this is more important than maximizing the harvest.

Thus, it is impossible to generalize about the advantages or disadvantages of branch-antlered bull seasons. Conditions vary from area to area, from elk population to elk population. We try to tailor regulations to meet both the biological needs of the elk and the desires of sportsmen.

Unquestionably, the character of elk hunting in Montana is changing. As elk security is steadily eroded, we will lose the special qualities that once attended this time-honored tradition. With an abundance of high-quality elk habitat, the debate over branch-antlered bull seasons becomes irrelevant—hunters can seek the hunting experience that meets their "ideal," be it a record book bull or just good meat in the freezer. Only with quality habitat and adequate elk security can we ensure the diverse elk hunting opportunities that we enjoy today. ■

Fig. 1—Comparison of Elk Harvest Levels Under Two Different Bull Hunt Restrictions (Boyd and Lipscomb, 1976)

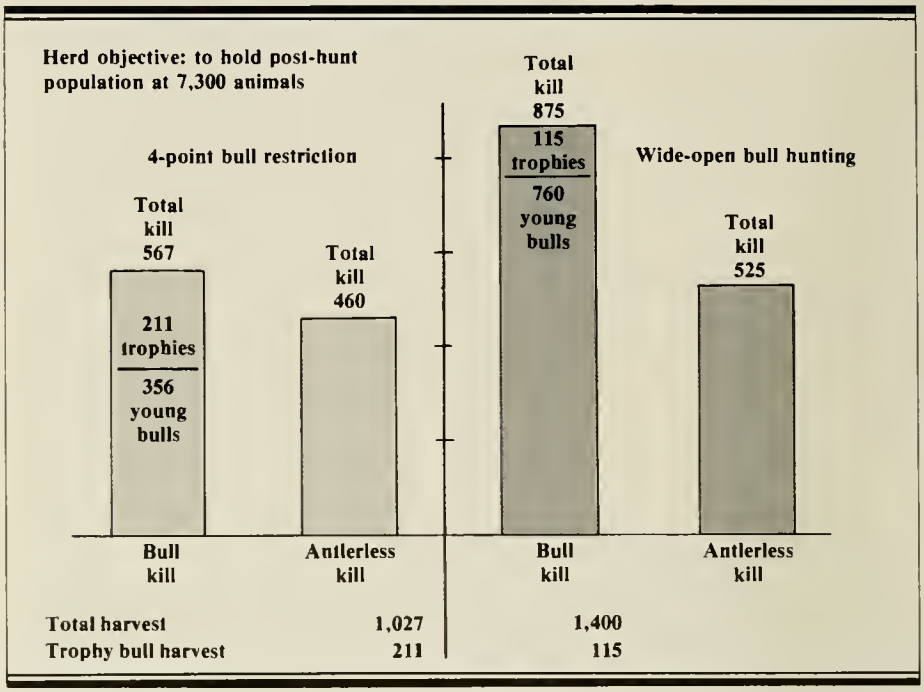

Table 1—A Comparison of Reproductive Success of Mature Bull Elk Versus Yearling Bull Elk[1]

	Yearling Bulls	Mature Bulls
Reproductive success of female (% pregnant)	23% (0-56% Range)	80% (58-100% Range)
Time of calving	7/1-15 (54%)[2]	6/15 (80%)[2]
Calf mortality	36%	13%

[1] Compiled from Hines, et al., 1979
[2] Date (percent of females)

Readers Respond

Reader Questions "Unkindest Bite"

I picked up your May/June 1983 magazine and was attracted immediately to "The Unkindest Bite of All," hoping to glean more information on rabies, since the disease cropped up just before Christmas and has been in the news since. This county is among those under quarantine.

But, I got to the fifth sentence: "Painful anti-rabies vaccines, with sometimes serious and disabling side effects, are administered. If these fail and symptoms develop, an unimaginably horrible death is certain."

In December 1982, a woman several months pregnant and her husband treated a calf who died of rabies. They underwent the rabies treatment because they had been in direct contact with the calf's saliva. Several persons here over the last few years have had the rabies treatment.

Since I was concerned about how the vaccine would affect a pregnant woman and her unborn child, I kept close tabs on this situation, including discussions with the woman on several occasions and questions directed to Dr. Don Ferlicka, state deputy veterinarian. The treatment, which is a series of shots, is not painful, the woman reported.

In a telephone interview about Jan. 18, Dr. Ferlicka said, "The new vaccine used for treatment of humans the past few years is both effective and safe." He emphasized that point again when he was here in early February to meet with local people concerned about the rabies situation and what to do about it. Incidentally, he said veterinarians, lab professionals, and others likely to come in contact with the rabies virus take pre-exposure vaccine as a matter of routine.

Your writers played down the role cats play in the spread of rabies, not even mentioning feral cats. Dr. Ferlicka said feral cats and skunks live together, feed together, and have ample opportunity to cross-infect each other. He and all veterinarians urged the destruction of all feral cats that are not vaccinated. They stressed this point repeatedly.

I feel your story on rabies completely missed research on the latest information on human treatment and completely ignored the key role played by feral cats.... Rabies is such an important issue to many Montanans that I believe it warrants more careful research for publication in your prestigious magazine.

One question people are asking me, and I haven't done the research, is: If a rabid animal drips saliva on grass or foliage, and a few minutes later someone is contaminated by that saliva touching an open sore such as a mosquito bite, what happens? Those kinds of answers should be important to wildlife personnel, too.

The May issue of *Life* carried a story on rabies, and, if my memory is correct, one person had contracted rabies and he had no idea how this had happened.

Maybe you can do a more updated and comprehensive article on rabies in the near future. I believe this disease deserves the best coverage possible.—*Gladys Silk, reporter, The Glasgow Courier; Glasgow, Mont.*

• *To answer the questions raised in Gladys Silk's letter, we forwarded it and our article on rabies to the U.S. Public Health Service, Centers for Disease Control; Atlanta, Ga. The reply, which came from William G. Winkler, D.V.M., chief of the Viral and Rickettsial Zoonoses Branch, Division of Viral Diseases, Center for Infectious Diseases, made the following points:*

"...In general, the article reflects considerable research on the authors' part. As with any article, there are some things which might have been said differently. Your correspondent was correct in criticizing the statement 'painful anti-rabies vaccines.' Currently available anti-rabies vaccines are no more painful than any other vaccine. They are also remarkably safe. The idea that rabies vaccination is painful and dangerous is a holdover from the days when as many as 23 doses of vaccine were administered, usually in the abdomen, and reaction rates were considerably more severe than they are today.

"Present treatment requires only one dose of globulin which is administered as a split dose, part at the site of the bite and part intramuscularly, usually in the buttocks, and five doses of vaccine given over a 28-day period in the shoulder area. Local reactions are common, but they are generally mild and transient. Systemic reactions are uncommon, and serious neurologic reactions are almost unknown....

"In general, while the article contains a few errors and is written in a more dramatic style than used in the scientific literature, I think it is well-done, reflects considerable research, and serves the ultimate purpose of alerting the public in Montana to the risk of rabies and provides data on the epidemiology and importance of this disease....

"The question of infectivity of rabies on inanimate objects such as grass is almost impossible to answer. The viability of virus outside of the living cell is dependent on numerous factors, including temperature, sunlight, humidity, etc. As a general guideline, we accept that if the saliva has dried, it is no longer infectious...."

Brings Home Closer

I was recently looking through a friend's issue of *Montana Outdoors* and, to say the least, I was impressed. The quality is outstanding, and I would like to commend you on a job very well done.

Being raised deep in the Cascades (a ways from Montana), I have noticed the beauty of both places have a lot in common. The quality photography that you've produced and the reality of it make home seem not so far away.—*C.M. Kershner; Gardnerville, Nev.*

Conclusion Questioned

Regarding *Montana Outdoors,* page 13, July/August 1983 issue, I am intrigued that Gerry Brown and Mike Madel already seem to infer that the "study" will demonstrate and "*minimize* (emphasis added) the impacts of mineral exploration [and mining?] and development on bears, grizzlies as well as blacks."

What were their criteria for presumably this early conclusion, i.e., before this "study" has been made? How do they answer the cynic who says, "Did the $50,000 grant pave the way for this decision?"—*Ludvig Browman; Missoula, Mont.*

• *Biologists Brown and Madel didn't write the photo caption—the* Montana Outdoors *staff did. The biologists at this stage of the study haven't inferred or concluded anything (except maybe that it would be nice to have a tree handy if one of the bears becomes "untranquilized" a little earlier than expected). To fit the available space, the caption needed to be compressed. The meaning we intended to convey was that the results of the study should make it possible to minimize the impacts of mineral exploration and development on bears.*—Ed.

OCTOBER ·FEVER·

by Gordon Stewart
illustrated by Vern Craig

DUCK hunters are a strange breed. Who else would get out of a warm bed in the middle of the night, put on four layers of clothes, jump into a cold pickup truck for a death-defying ride to a duck marsh, then climb into a leaky boat filled with dilapidated decoys and questionable companions (or is it questionable decoys and dilapidated companions)? Opening day of duck season a few years back found me doing just exactly that.

But wait a minute, I'm getting ahead of myself. It all started at 3:30 a.m. when the alarm went off. And 3:30 in the morning on the duck opener is not the time to question the wisdom of it all. It's much easier just to stumble around the kitchen clutching a cup of coffee in one hand and a pair of socks in the other. Let's see...where did I put that blasted duck call?

The valley seems particularly foggy this morning; so foggy, in fact, that it's hard to make out the headlights of the pickup as it pulls up in front of the house. How in creation are you supposed to see a duck or goose at 40 yards when you can't see a pickup at 20 feet? But like I said, it's no time to get philosophical. It's better to just mechanically go about your business, sipping hot coffee and mumbling "Good morning?" to the other early risers.

Gear finally loaded in the truck, off we go down the road, picking our way between the ditches and telephone poles by a kind of hunter's braille. Luck is with us, and we don't meet another car all the way to the slough. But then, who else in his right mind would be out of bed at this ungodly hour?

The boat is unloaded from the truck and a small mountain of gear is stowed on board. Let's see now, we should have five bags of duck decoys, six large floating goose decoys, three shotguns, six boxes of shells (duck hunters are eternal optimists), two pairs of binoculars, three life preservers, one flashlight, three pairs of gloves, three thermos bottles of coffee, three sets of rain gear, assorted snacks...hmmm, where are we going to sit?

After a heated debate about who gets to row the boat (bad backs, arthritis, and related complaints have suddenly afflicted three otherwise healthy men), we finally get wedged into our positions among all the gear. Steve, the lucky winner of the "who's going to row the boat" game, says, "Where's the oars?"

Silence. The answer, of course, is obvious: still in the truck. It's back out of the boat, for the beginning of that entertaining duck hunting pastime known as the "yo-yo" game. This involves five or 10 minutes of bouncing in and out of the boat like yo-yos until the oars, the pipe tobacco, candy bars, and numerous other last-minute necessities are accounted for.

Finally, we're off in a "flash" to the weed bed on the far side of the slough. The "flash" turns into a 25-minute, cold, damp trip through heavy fog, with the flashlight being next to useless. For a while we wonder if we are going around in circles in the fog and will end up an hour

later back at the truck! But luck is (sort of) with us, and we finally bump into the weed bed; we realize that our navigation by "dead fog reckoning" has landed us about 120 yards north of our destination. But at least we now know where we are, and the rest of the trip is uneventful.

"Get out the decoys, Bruce," I say. He passes two bulging bags forward to me in the front of the boat. Bruce and I start untangling anchor strings and pitching decoys over the side of the boat in a "perfect pattern." Let's see, should we try the modified fish-hook pattern or the mitigated fog-bound pattern? Looks like the latter, since we can't see a darned thing.

Forty-five minutes have passed since we left dry land and we are now able to push our way into the thick cattails on the edge of the slough. "Great morning!" opines Bruce.

"Ugh," says Steve.

"Pass me my thermos," I say. Now we begin a familiar game known as "search for the thermos." All duck hunters have played it. Everyone begins digging through the gear in the bottom of the boat, spilling boxes of shells, until the missing thermos is found. It's a good game to kill time during those last few minutes before the arrival of legal shooting time. As every duck hunter knows, the last 10 minutes seem to stretch into about two hours.

With two minutes to go we load our shotguns. I place mine across my lap and pour a cup of hot coffee to keep the cold fog from penetrating my inner self. The first streaks of light begin to show in the east (at least we have convinced ourselves they have begun to show). Steve stands up to survey the decoys. He can't see them.

The magic moment has finally arrived. A whir of wings and gentle splashes in front of our blind indicate the first arrivals of the morning. Bruce whispers, "Where are they?"

"Somewhere out in front of us," Steve whispers back. All we can make out are small waves as they lap against the side of the boat. I say something nasty about the fog, apparently a little too loudly. Another whir of wings and our first visitors are gone. Oh well, another cup of coffee to settle the nerves.

The fog slowly lifts a little, and finally we can see our decoy spread. "We set out a great pattern, didn't we," says Bruce.

"Not bad," I reply, "only about five of the decoys are upside down."

The fog lifts a little more, and now the ceiling is hovering about two dozen feet above the water. It seems to be settling in for the day. My third cup of coffee is about one-third gone when I detect a movement over the water, as a large bird drops out of the fog. Steve and Bruce, who are busy drinking coffee and debating the merits of electric long underwear, are oblivious to the Canada goose that has decided to pay us a call. Overwhelmed by hunting instinct, I jump to my feet and snap a shot in the direction of the bird, which, much to my surprise, tumbles out of the sky like a sack of cement.

The good news is that Thanksgiving dinner is now assured. The bad news is that I have once again played the duck hunter's game known as "hot pants." This is when you jump up quickly and spill the contents of your coffee cup in your lap. As the morning wears on, and the coffee cools off, I wish for a set of electric long underwear.

My partners, having been caught napping, are now keen and alert. In fact, you could almost say they are *desperate*. They start lasering the fog like a couple of hungry eagles. About 9 a.m. we hear the whir of wings in the fog, and use our duck calls to let them know they have friends down below. After a quick turn, a nice flock of mallards drops down through the fog, landing gear extended.

We jump to our feet, and I pick out a fat drake—but the muzzle of my gun suddenly lurches upward, and the birds are gone before I can get back on target. I glance toward the other end of the boat and see Bruce, who has apparently had the same problem, looking back at me. But where's Steve?

Ah, yes, he has played that most daring and exhilarating duck hunting game of all, known as "fall out of the boat backward." In his zeal to bag his first duck of the season, he has jumped up a little too quickly, and managed to get his feet tangled in the process. He is now reclining comfortably on his back in the muddy water, spouting swamp water and cattail fluff.

To this day we still chuckle over the cattail bed episode, and even Steve now manages to see a little humor in it. Of course, he swore us to secrecy in the duck marsh that day. And, being men of honor, we honored his request...until we got out of the duck marsh. We soon fell prey to that most delightful duck hunting pastime of all, telling duck hunting stories. After all, they're the only thing that keeps us going over the winter, spring, and summer, during the long wait for "October fever" to come again. ■

A 1980s Dust Bowl? *continued*

Colorado counties are drafting similar ordinances.

North Dakota has taken a hard line on the conversion of fragile grassland to cropland by speculators. In answer to a letter of inquiry to North Dakota on the subject of plowout regulations, Jeff Weispfenning, research analyst for the state's Department of Agriculture, writes:

> Probably the main impetus behind us was the line coming down from Washington and USDA urging farmers to plant "fencerow-to-fencerow" to meet the booming export market....Probably the main reason that we haven't had outside speculators coming in is that up until 1981, we had the strongest anti-corporation farming law in the country. In effect, corporations were forbidden from owning farm land and that meant *all* corporations. Beginning in 1981, family corporations have been allowed to own farmland and farm. This law, though, is pretty tight in determining who is eligible to own the land, and hopefully will continue to provide the protection against outside speculation.

After poring through drifts of written material in my search for information on plowouts, I noticed that one significant word was frequently missing—wildlife. I suspect the impacts of plowouts on wildlife—the nibbling away of a chunk of country here, and a piece there—have not really registered in the minds of most of us. And with good reason: We have little documentation as to what the total picture of wildlife loss is on such altered landscapes. Knowing from our aerial surveys that there was a 97% decline in antelope numbers on the Angela farm unit after it was plowed gives us only a single frame from a motion picture film. One thing we do know: The shrinkage of wildlife habitat from plowouts is a direct and unmitigable loss to wildlife.

Good farming operations have been an incentive to many wildlife species. No argument there, but wildlife bankruptcy from plowouts is another matter. Shortgrass prairie and its wildlife inhabitants represent the end point of millions of years of evolution and it can't be restored overnight, if in fact it can be restored at all. Ask the best authorities how long it would take for nature to restore a 50,000-acre plowout back to shortgrass prairie; chances are you will probably get no more than a shrug of the shoulders and a slow shake of the head.

How do most Montanans feel about plowouts? The news media have done an excellent job of painting a factual picture of modern-day sodbusting. Editorials such as a recent one in the Great Falls Tribune leave little doubt how most feel about the subject: "Modern sodbusting is obviously motivated by profit. But it's different from what drove homesteaders to endure droughts, blizzards, grasshoppers, and lonely isolation in Montana. Those people had dreams of profit, too, but they also dreamed of family, home, security, and God and community.

"Compared to them, the modern sodbuster is a magpie, a thistle, an alkali seep, a blight on the land."

Despite the excellent land stewardship being practiced by many farmers throughout the country, most farmers would not argue with the fact that a new prescription is needed for using and caring for our agricultural lands—a prescription that provides for a better land ethic, an ethic shared by all citizens of this nation.

What kind of land ethic? I think it has to duplicate the philosophy of Curtis R. Stratfeld as expressed in his *Audubon* (May 1977) article, "Plowing: an Inquiry:"

> ...it [the land] need not be subjected to wholly artificial contrivances to wrest from it a crop; to farm here, I can be a seducer, not rapist; lover, not violator...I will not destroy nature; I will intrude upon her for our time here on earth. At most, I will elbow her back a little, carrying out the instructions of my father and grandfather. There is plenty of forest still for the wild things, edges for the waiting weeds and grass seed, swamp for the creatures who need the swamp, and I will not destroy those things. There is room enough for us all.
>
> Men less cautious than I have harnessed the atom and won fame; but they have harnessed it to the horses of the apocalypse, and their only final victory is death. There will be no final victory for me here; they may seek to conquer nature, but as farmer, I seek only to nudge her a little. I know that she and I will someday lie here together in final embrace. ■

We should have learned an unforgettable lesson from the "dirty '30s," but the human memory is sometimes woefully short.

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The Silver-Tipped Sweater *continued*

can't he sleep when he doesn't have to get up and chase bears like the hired help!"

However that may be, we three shook hands that never a word of this would ever be told while it mattered to any of us. As it happened, Chad actually had the grizzly in the trap the very next morning. His coat was a perfect match for the senator's sweater. Evidently Chad's liberal scattering of the salmon bait far and wide around the trap finally overcame the big fellow's fear of entering a man-made contrivance. And the whole thing ended when the bear, having gotten a few samples of what the black hole promised, walked in and the gate dropped shut behind him.

We never spoke of it again and I'm thankful to this day that my father taught me not to shoot until I was sure—absolutely sure—of the target! ■

THE FOLKS BEHIND THE BADGE

by Mike Aderhold

MIKE ADERHOLD

Toren McCarthy, Kalispell warden, and confiscated game meat ready for public auction.

IN THE WINTER of 1864-65, the Montana Territorial Legislature passed a bill requiring a hook and line to take trout. In 1869, the first laws protecting game birds were passed and, in 1881, a law made the dumping of sawdust and mill wastes into streams illegal. However, violations had to be serious to warrant action by the U.S. marshal.

When Montana became the 41st state in fall 1889, county commissioners were empowered to hire one game warden for each county. Either there was little money or little concern, because no wardens were appointed.

The first Fish and Game Commission was established by Gov. Robert Smith on March 4, 1895, and the first state game warden was appointed in July 1889.

The Montana Fish and Game Department was organized in April of 1901. The bill establishing the department provided for division of the state into fish and game regions and the appointment of not less than five or more than eight field wardens.

An unpublished department history by Fisheries Biologist Bill Alvord states that the salary of the first wardens was set at $100 per month. After announcing these positions, the department received over 1,000 applications and several thousand letters of endorsement. The first eight wardens were assigned to Teton County, Malta, Missoula, Deer Lodge, Great Falls, Butte, Bozeman, and Miles City. Since the salary of $100 per month included travel and living expenses, the positions were no bargain. One of the game wardens reported that in his first month on the job, he spent all but $9.40 of his salary on travel.

• *This is the first installment of a two-part article. Watch the Nov./Dec. issue for profiles of "More Folks Behind the Badge."*—Ed.

By the end of the 1920s, there were 22 wardens, the salary was up to $125 per month, and they were allowed actual expenses up to $600 per year. By 1942, the number was up to 34, but because of the war, it dropped to 23 in 1944. The number of wardens peaked at 75 in 1972.

Today there are 65 field wardens, five warden sergeants, seven regional captains, and six administrators and program managers in Helena. The starting salary is $7.77 per hour; for a field warden with 25 years in, it can work up to $13.61 per hour.

The job description has expanded over the years. A 1929 law book says that field wardens will devote all of their time to their official duties—to see that the laws of the state and the rules, orders, and regulations of the Fish and Game Commission, with reference to the protection, preservation, and propagation of fish, game, and furbearers, are strictly enforced. They also were to see that all who hunt, fish, or take fur have the necessary licenses.

In 1953, increased effort was directed toward preventing violations, and information and education work was added to the duties. By 1958, only about 30% of a warden's time was spent on law enforcement. Fifteen percent was taken up with administrative duties, such as routine inspection of license agents, game and fur farms, fish ponds, outfitters, fur dealers, and locker plants, and maintenance of fish and game buildings and equipment. Twenty-five percent was directed toward management activities such as game and furbearer damage control, trapping and transplanting, game bag and creel censuses, fish planting, stream and lake surveys, predator control, checking stations, and game surveys. The remaining 30% was spent with public information and education activities, investigating hunting accidents, hunter safety classes, boating safety, civil defense, and fire fighting.

The warden was expected to do it all, and the department began putting on specialists to help.

In 1966, emphasis was added to landowner/sportsman relations by promoting responsible public use of private land and assisting private land managers with their problems of rustling and vandalism. In 1969, the courtesy citation was introduced, along with enforcement of a state litter law for private property open to recreation. Wardens also received a new responsibility: enforcement of state parks regulations.

The 1971 formal "Law Enforcement Goals" included promoting hunting and fishing access for the public; encouraging cooperation among agencies; groups, and individuals concerned with laws pertinent to wildlife, and promoting hunting, boating, and water safety. New outfitter regulations and boating and water safety laws were adopted.

In 1972, a snowmobile safety program was added, and wardens were asked to enforce snowmobile noise regulations.

In 1975, law enforcement officers audited 6,363 license dealers, obtained creel or game bag information from 79,120 hunters and anglers, and represented the state wildlife agency at 320 sportsman's club meetings.

In the 1970s, wardens were asked by the Legislature to certify falconers, taxidermists, and roadside zoos; help collect the county property tax on boats, and investigate wildlife damage complaints.

It's a big job, and it requires top hands to get it done. Fewer than 300 people have served Montana as game wardens during the 82-year history of the department. What follows is a sample of the personalities, talents, and grit necessary to get the job done:

THE COMMON THREAD

5 a.m., Glasgow Warden/Pilot Bob Stordahl, 49, 13 years service

At dawn, we pushed the state's Super Cub out of the rented hangar at the Glasgow airport. This July morning, we have three jobs to do: check the reclamation on the Northern Border Pipeline Project, check and photograph the proposed Bitter Creek Prairie Wilderness Study Area, and check the number and production of antelope just below the Canadian border.

Capable, professional, confident, recognized by his peers as "Warden of the Year" in 1979, Bob is the best all-around law enforcement officer I've ever encountered. Good husband and father, quick, bright in a practical sense, blessed with a talent for woodworking, plumbing, electrical work, and gardening. For 10 years, unselfish home repair and remodeling consultant for the Glasgow regional office. Mild-mannered, easygoing, inventive, persistent, long on initiative—he has most of what's needed for law enforcement work. Son of the lower Yellowstone Valley, he's as eastern Montana as the cottonwood. Why is this guy, who could succeed at anything, a game warden?

The unspoken answer unfolds before us as we bank north, less than 300 feet from the ground. Prairie and wheat fields running to the horizon, creeks and reservoirs sparkling in new light, a lone mule deer buck in velvet, molting geese diving and scurrying for cover, a band of whitetails with their flags waving, coyote and pups at the mouth of a den, a rooting badger, a wandering family of skunks, flitting mourning doves and meadowlarks, a running band of antelope, four pelicans in the distance.

The wildlife resource is the common thread, the single strand that brought them to this work and ties them all together. And it's the beauty and unpredictable nature of this wild resource, the challenge of conserving, protecting, and working with these animals, and the feeling that this resource needs them that keeps them working hard.

WITHOUT FANFARE

6 a.m., Whitefish Area Warden Dave Wedum, 44, nine years service

Heading east on U.S. Highway 2 around Glacier Park, towing a culvert trap with a female grizzly to the east side and a new home. Some people become famous working with grizzlies, not Dave.

Single, refreshingly shy, unassuming, Dave Wedum looks like a 1920 photo of Montana's artist hero Charlie Russell, and he acts like someone who grew up next to a mountain: humble.

As a teenager and in his early 20s, he already had a reputation in the Bob Marshall as a fine mountain horseman, guide, and packer. He's a 1964 wildlife graduate of the University of Montana, and he spent the winter of 1965-66 in the Salmon River country of central Idaho working with mountain lions. After time with the

MIKE ADERHOLD

Leonard Secor, retired warden captain for the Glasgow region, with a yearling cow elk at the Yellowstone Game Farm.

Forest Service and Soil Conservation Service, he joined the department as an education specialist in 1967, and later worked as the information officer in Great Falls. A good writer, better than average photographer, and colorful public speaker, he left all of that in 1974 to become the warden in Whitefish.

Over the past nine years, in his peculiar quiet way, he has handled and taken care of more problem and displaced bears, both black and grizzlies, than any person in the department. During the first part of October in 1980, he turned up at the Kalispell office with six grizzlies in eight days. No fuss or fanfare. Same with the three or four mountain lion problems he's handled. Same with the moose he occasionally escorts throught the wilds of downtown Whitefish.

The only incident I've heard him spend more than three sentences on was the time he and several Whitefish policemen tried to corral a porcupine at 2 o'clock in the morning.

Laboring in the shadow of Glacier National Park and the valley of the wild and scenic North Fork, working with grizzlies, mountain lions, elk, moose, and black bears, Dave Wedum carries on as if it were as usual as washing the dishes and feeding the dog.

TEAMWORK

9 a.m., Circle Area Warden Rich Furber, 37, 11 years service

He's an original. When everyone was clean shaven, he had a full beard. With his constantly changing routine and new ideas, he would frustrate even the sharpest poacher. He's the kind of guy who would take the family out for fishing on the weekend and, while the kids were napping, he would check fishing licenses. He makes some of the best cases just doing the unexpected.

An ex-Great Falls schoolteacher and scoutmaster, Rich is always ready and willing to help people, especially children. He is, in my opinion, the best youth worker and educator in the warden ranks. He is also somewhat of a free spirit.

Right now he is part of a collection of spare parts irreverently referred to as "the McCone County Fish and Game Commission." The team includes: Area Biologist Ron Stoneberg, who prefers beat-up boots, old-style cowboy hats, bandannas, and who looks like he has rolled around the sagebrush for a hundred years; Rose Stoneberg, Ron's smart, savvy, and shy wife who works as a veterinarian in Circle and who grew up in a remote Montana town called Faranuf; Bob Jensen, McCone County's popular and articulate long-time sheriff and new fish and game commissioner; Jim Groh, rancher, hunter, and perennial officer in the Circle Rifle Club, and Jim's wife Joan, long-time hunter safety chief who may know as much about hunter safety, guns, and hunting as any woman in the state. Together, this group knows just about every man, woman, and child in the 3,000 square miles around Circle. They see each other almost every week, and their wildlife efforts are as democratic as America.

Nowhere in Montana are the wildlife interests of the residents so well-known, respected, and represented. Nowhere is cooperation and selfless interest in the wildlife resource so evident. The situation in McCone County puts to rest almost every derogatory rumor and criticism about hunters, the department, and government responsibility.

GREYHOUND

9 a.m., Thompson Falls Warden Chester Lamoreux, 32, 10 years service

The kid's a greyhound—quick, active, nervous, and aggressive. That kind of nature rubs a few people the wrong way, and every so often he'll put the bite on a person of means or influence and they'll bite back with a letter of complaint to the governor or director. By the time it works back through the chain of command, Chet's light years down the road and can hardly remember the incident.

The last few years when the legislative Fish and Game Committee has argued the Fish, Wildlife and Parks budget, I've thought about Chet. If he had more gas money, he would cover more miles, check more people, and make more cases. It's possible if he had too much

money, he would self-destruct in a Cabinet Mountains Canyon, trying to check some mountain goat hunter's permit and license.

For a year and a half—with the stealth of a coyote, the persistence of a weasel, and the watchful patience of a snapping turtle—Chet has painstakingly documented, in almost complete secrecy, the behavior and activity of an organized poaching ring. Only four people in the whole fish and game knew about the investigation. With infinite care, the trap was set, federal undercover wildlife agents were brought in, and officers from other states were alerted to the extent and breadth of the ring. By the end of May, the case was made and the first subpoenas were served on what may turn out to be the largest organized trophy poaching operation ever uncovered in North America. A scandal of major proportions, involving big money, international dealings, interstate traffic, and people in high places.

Many wardens become so protective of the wildlife in their areas that the resource becomes almost an extension of their own lives. With an ear to the ground and a feeling that some older game animals were disappearing at the wrong time of the year, Chet began (with only his wife for counsel at first) to unravel the mess. Ironically, one of those arrested was also one who complained to the department about Chet's work.

GAL WARDEN

11 a.m., Kalispell Area Warden Toren McCarthy, 33, seven years service

Like the others, she has developed her own law enforcement style. Water safety and hunter safety are her specialties, but she has done her share of license checks, bear trapping, night patrolling, and has written more than her share of tickets.

At 5 feet 1 and ounces over 100 pounds, with a pleasant disposition, a ready smile, and a soft-spoken manner, her non-threatening approach is surprisingly disarming. Most of the time, the offender will gladly load confiscated game, and only a few question if she really is a warden. She is amazingly adept at parrying the rare gruff response.

She brings to the hard work a strong sense of concern and caring, and people pick up on it. Within the context of her authority and responsibility, she is something of a problem solver, a fixer, and she has a knack for taking the pressure off a heated situation.

"We are, after all," she reminds everyone, "working with misdemeanors and good people who have simply made bad judgments or are ignorant of the law."

More patient and resilient than most, she is hard to discourage, and this characteristic, probably more than any other, has helped her in the long uphill struggle to become Montana's first and only female warden.

Token woman warden? We hope not. Over the years, she has more than proved that she deserves to stand with the rest. Any women who follow her will have an easier time because she helped blaze the trail.

DARK MOMENT

11 p.m., Lewistown Area Warden Ron Gusick, 49, 15 years service

He looks like Gary Cooper, acts like him, too. Tall, lean, quiet, he grew up in the Highwoods. Generally works alone, and he's good.

The fish and game uniform is the same for everyone, but he's the one the tailor had in mind when it was designed. He has that lean hard cowboy look of the rancher in the Marlboro ads.

Law enforcement work can be dangerous.

In the early 1970s, when Ron was the Chinook warden, he was coming home north from the Breaks along Clear Creek near Hungry Hollow. It was late at night, and he passed a beat-up car heading the same way. After a mile or so, he decided to pull off the road, shut down, and check the car again as it came by.

But the car didn't come by. So he doubled back and found it jacked up and someone with a weak two-cell light checking underneath it.

He offered help, but all three said the situation was under control. But they clearly could have used more light. So Ron pulled around in back of the jacked-up car and turned on his spotlight, keeping the running lights on. This was before sidearms were issued, but some instinct told him to take his shotgun out of the rack and lay it on the front seat. The pickup window was down.

At this point, he later said, his only motive was to help. But as he approached the front of his rig, he spotted some blood on the car's rear bumper. He became more alert.

After a few minutes, the vehicle was lowered. Ron asked to see inside the trunk. After some hesitation, it was opened—three deer and an antelope. Tension.

With light from the spotlight, he could see a .22 rifle in the backseat and he picked it up. The condition of the poached animals indicated there had to be another gun, but he couldn't see it. He asked where the other rifle was, and no one answered. Suddenly, one of the three made a quick move for the front seat. Just as quickly, Ron took two steps backward to his cab, pulled out the shotgun through the open window, barrel up, and said something like, "Don't do it," or "Easy." Heart pounding, adrenalin pumping.

Time stopped. Even though they encounter armed people all the time, most wardens spend their whole careers without an armed confrontation. Warden and violator were now locked in on the same wave length. The violator, looking directly at the warden, slowly eased the high-powered rifle out and laid it on the hood of the state rig. Ron followed them into town where a routine police check showed that the individual who moved for the rifle had been involved in a police shoot-out three months before and had eluded arrest.

In front of the library in Thompson Falls, there is a granite memorial to Town Marshal Don Williams and Game Warden Gene Sara, who gave their lives in the line of duty on Jan. 7, 1974. Gene, an experienced warden recently assigned to Thompson Falls, offered to help a new city policeman respond to a family dispute. He was killed just as he approached the site. That is the last time, but not the only time, Montana wardens have stood in formation at the funeral of a colleague who was killed on the job. Hopefully, it will be a long time before they are called on to do it again. ■

Contributors

• The events that unfold in **A. David Cannavina**'s article, "The Silver-Tipped Sweater," took place more than 35 years ago. But the lesson the tale teaches is as timely today as it was then. The main characters include Burton K. Wheeler, then a U.S. Senator from Montana; a roaming grizzly bear, and three rangers in Glacier National Park. Mr. Cannavina spent all of his National Park Service career in Glacier, retiring as assistant chief ranger in the mid-1960s. He moved to Kalispell, and died there more than a year ago. Editor of the article, **Eldon Bowman**, operates Canyon Country Outfitters in Flagstaff, Ariz., and worked as a backcountry seasonal ranger in Glacier in the '60s with Mr. Cannavina. Turn to the article on page 6.

Robert Spannring created the art especially for this issue of *Montana Outdoors* to illustrate "The Silver-Tipped Sweater." A frequent contributor to *MO*, his work is available from Tatem House Gallery, Helena; Hole in the Wall Gallery, Ennis; Bud Lilly's Fly Shop, West Yellowstone, and Mountain Meadowlark Gallery, Billlings. Spannring is manager of the West Boulder Reserve near McLeod, a a private ranch dedicated to preserving wildlife habitat.

• "The trip from the world of the factory or office to the world of towering pines, steep mountainsides, rugged trails, fleet-footed deer, and bugling elk is only a few hours in a four-wheel-drive vehicle. Yet the energy needed to hike a steep mountain trail or pack out an elk is a world apart from the energy needed to lift levers, push buttons, or shuffle papers." **Robert W. Moon**'s and **Thomas R. Whiddon**'s article tells everything you need to know about "Getting Ready." Moon is the health promotion consultant with the Department of Health and Environmental Sciences; Whiddon is an associate professor in the Health and Physical Education Department at the University of Montana, Missoula. Their article—with its timely and practical proposed regimen—begins on page 8.

• Many hunters have become accustomed to the convenience of four-wheel-drive vehicles for help in retrieving game animals. But road closures—necessary in places to provide adequate security for big game animals—are changing the situation. As **Mike Frisina** writes: "Some hunters believe if you don't have access with a vehicle or a horse, there is no way to bring a big game animal out of the field." But he points out that hunters of earlier days got along fine without vehicles and goes on to suggest four ways that will not only do the job but also give the hunter a feeling of pride and accomplishment. Frisina is a biologist with the department's Wildlife Division, working out of the Butte area. "Rediscovering Lost Skills" leads off "The Catchall" section on page 11.

• A downwind resident of Terry wrote to the Miles City Star editor the day after the storm. His letter began: "Angela blew by last night." He was expressing dismay over loss of precious topsoil from the Angela plowout, a 20,000-acre chunk of fragile prairie grassland plowed in 1976 and 1977, and then block farmed. But Angela—a small dot on the map 28 miles northwest of Miles City—is not the only place sodbusting is taking place in the state. According to a report prepared by the Department of Revenue, 749,822 acres of grassland was converted to non-irrigated cropland in Montana between 1977 and 1982. For a comprehensive look at this pervasive and startling problem, turn to page 15 and **Ken Walcheck's** article, "Sodbusting in Montana: A 1980s Dust Bowl?" Walcheck is the department's information officer for the Miles City region.

• The questions surrounding branch-antlered bull elk seasons put just about everybody interested "On the Horns of a Dilemma." In some areas, such seasons may be needed to help restore herd productivity by ensuring the presence of mature bulls for breeding purposes. In other areas, where herd productivity is not a problem, the effects of branch-antlered bull seasons are not as clear. The real culprit is declining elk security due to steadily increasing access and decreasing cover. As **Glenn L. Erickson** writes: "Changing the hunting regulations will not restore lost habitat and elk security....only with quality habitat and adequate elk security can we ensure the diverse elk hunting opportunities that we enjoy today." Erickson's article begins on page 20. He is the statewide and special projects bureau chief for the department's Wildlife Division in Helena.

• "October Fever" is a disease likely to strike those who arise at unspeakable hours, attire themselves in many layers of clothing, ride through the still-dark night to a cold, damp duck marsh, and then climb into a leaky boat filled with "dilapidated decoys and questionable companions (or is it questionable decoys and dilapidated companions)?" Although the sport of duck hunting is replete with noteworthy activities, the telling of yarns is surely one of the most delightful. And that's what **Gordon Stewart** has done, beginning on page 24. A social worker for the state in Kalispell, Stewart has served as president of Flathead Wildlife, Inc. for two years, and he enjoys wildlife photography, fishing, camping, gold panning, and writing about Montana's wildlife.

• We think you'll enjoy **Mike Aderhold**'s profiles of "The Folks Behind the Badge." They are the department's law enforcement officers, and they're a diverse, tough, sensitive, and interesting lot. In this issue, Aderhold profiles Bob Stordahl, Glasgow; Dave Wedum, Whitefish; Rich Furber, Circle; Chet Lamoreux, Thompson Falls; Toren McCarthy, Kalispell, and Ron Gusick, Lewistown. Their stories start on page 27. Watch the Nov./Dec. issue for "More Folks Behind the Badge." Aderhold is the department's information officer for the Kalispell region.

• Marking big game animals with radio collars, colored neckbands, and ear tags can aid researchers in learning more about the animals' seasonal movements, home range sizes, habitat preferences, and responses to hunting pressure. But capturing these wild creatures to gather biological information and affixing things like collars and tags is physically demanding and sometimes dangerous. **Gary Olson** explains some of the capture techniques in "Catch Us If You Can," beginning on page 32. He emphasizes that biologists will never know all they would like to about secretive wildlife species, but modern capture techniques are helping close the information gap. Olson, who is headquartered in Conrad, is a biologist for the Wildlife Division.

• The flammulated owl is a "Master of Camouflage," as attested by **Judy Hoy's** painting and article (page 26). This small owl—only about six inches high—is difficult to spot in its daytime roosts, and resembles a miniature great horned owl. Hoy is a self-employed professional artist and volunteer co-manager of a wildlife rehabilitation center. She works in many media, including one she developed herself, "pictorock," using soft, colored rocks, charcoal, and sandstone. She has shown her work at the Ducks Unlimited National Wildlife Art Show, the Denver Audubon Society Annual Benefit and Art Exhibit, the Missoula Museum of the Arts, and elsewhere. Most of her art is done by commission, but some pieces are available at the Upstairs Gallery, Hamilton, and Marie's ART-eries, Missoula.

• *MO* appreciates the contributions of the following photographers: **Kelth Aune** and **Kristi DuBols**, Choteau; **Harry Engels**, Helena; **Louis M. Kis**, Kalispell, and **Tim Lucas**, Bellevue, Wash.

Catch Us If You Ca

article and photos by Gary Olson

WE HAD been lying motionless (more or less) all morning behind some limber pines just 30 feet from a supposedly well-used goat lick. (We were beginning to wonder about that term "well-used," though.) A large black fly began to distract me by repeatedly investigating my left earlobe. Not only that, but the late June sun, now almost directly overhead, was beginning to make us both perspire and itch as a myriad of insects began to discover us. Mike carefully opened a can of tuna and then scanned the mountain face for any sign of goats. "Nothing yet," he commented wearily.

I motioned to his uncovered lunch. "Look closer. You'd better hurry if you plan to eat that!" No less than eight species (it seemed) of bugs had gleefully hopped, crawled, or flew onto the opened can. Somewhat unsettled but not to be outdone, he merely shook the can a few times and commenced eating.

The long hours wore on, until in midafternoon four mountain goats could be seen carefully moving down slope toward us. As we watched, the goats continued to drop down the towering cliffs until they disappeared from view in a small ravine. Early that morning, we had checked the 40-by 60-foot cannon net carefully for any tangles and laid it to the side of the lick area. Each of the four rockets and charges had been checked and rechecked as the detonating cord was connected to each one and strung through the trees to where we were hidden. Neither of us wanted to pack the 250-pound load of steel posts, rockets, net, and wire up the mountain again, so we were praying the goats would keep coming.

We were high in the mountains along the Rocky Mountain Front northwest of Choteau, Mont. Mike Thompson, a graduate student from Montana State University, Bozeman, was hoping to radio-tag several goats in this area to find out more about their seasonal movements and home range sizes. This could be the opportunity we had been waiting for.

After what seemed like an eternity, two adult mountain goats and two kids appeared on the trail leading out of the same ravine they had disappeared into earlier. As they approached, shaggy coats silhouetted in dust from the trail against the sheer cliffs to the west, our hearts began to pound. The lead nanny paused at the edge of the lick to survey the scene. We hoped she wouldn't spot the net lying off to the side, or the wire leading into the blind (or the tree shaking that I was lying under).

Finally, with an air of indifference, she entered the lick and began pawing the dirt in a large depression near the center of the area. Mike wanted to wait until all four were well within range of the net before touching it off. I remember thinking how comical and yet regal the animals looked, with long strands of matted, dirty hair hanging from their sides. Their heads, necks, and upper shoulders were already in the summer fashion of short, creamy white hair.

Mike cranked the detonating box and a deafening roar engulfed us as the rockets fired out over the lick, pulling the net with them. As the smoke and dust cleared, four animals were struggling under the net. He let out a yell that would have rivaled the original ape man and raced into the chaotic tangle of net and goats, and I

hurried to help.

After each goat was subdued, six-inch sections of garden hose were placed over the needle-sharp horns to prevent the goats from injuring each other or us. A special hard-plastic neckband with a radio transmitter inside was placed around the neck of each nanny, and ear tags with identifying numbers were placed in each ear. The kids were only ear-tagged, since their necks would grow, while the neckbands would not. Body length, height, weight, age, and physical condition were measured and recorded for all four goats. Aging is done by counting annual rings on the horn and estimating wear of teeth. Together, these methods yield a fairly accurate estimate.

Neckbands with radio transmitters inside, like the one just fitted to the goat in the photo at left, allow researchers to learn more about the animals' seasonal movements and home range sizes. Most wildlife studies are physically demanding and sometimes dangerous; the size and weight of elk (below) require a team approach.

Each kid was paired with its mother before release so needless separation could be avoided. We didn't want to put any more stress on them than we had to. As the net was rolled off each pair, they scrambled up and ran about 100 yards before assuming a more normal gait. Mike grinned and said, "Looks like I've finally got a research project going."

"Yes, Marlin, I think you do!" was the only response I could come up with at the time.

The research involved with studying wildlife is physically demanding, often frustrating, and sometimes dangerous. Mountain goats, deer, elk, grouse, and trout have their own ideas about where they should go and what they should do, and they just don't cooperate as well as guinea pigs and white mice. But the best way researchers can gather information to further the science of wildlife management is to go out and meet each species on its home turf. This often requires specialized techniques—procedures developed by trial and error. The purpose of this article is to describe a few of these techniques and to summarize what we hope to accomplish by using them.

One such technique is called "drive netting." This is used when large numbers of animals, such as deer, are in a relatively small area. The technique has been used in Montana since 1980 and it requires a sizable ground crew, a helicopter, and an eight-foot-high net or nets several hundred feet long. In March 1982, it was used in the Tiber Reservoir area in an effort to tag deer for studies of behavior, movements, and population size.

Eighteen of us lay hidden under or behind anything that afforded some cover, such as large rocks and bushes, while a helicopter pilot skillfully maneuvered five mule deer toward the hidden net. The sound of the approaching helicopter is especially exciting, since you don't know when or where several mule deer might explode over the ridge into your section of the net.

When the five mule deer hit the net at various points along the two 300-foot sections, the scene was instant chaos. People were struggling to hold onto the frantic deer while radio

transmitters, colored neckbands, and ear tags were applied. The radios are sealed inside plastic pipe specially fitted to the shape of a mule deer's neck. The transmitter emits a signal detectable with electronic tracking gear, usually from the air. Individual animals can be monitored for as long as the batteries in the transmitter last, usually about two years.

Monitoring the deer can provide valuable information on migration direction and length, effects of hunting, location of breeding and fawning areas, extent of winter and summer ranges, food habits, and habitat preferences. It is important to sample both sexes and various age classes for a fully rounded picture of the population. Age can be determined by inspecting the animals' teeth for wear.

In most cases, only a small proportion of the captured deer are tagged with radio transmitters, while the rest are fitted with color-coded neckbands. If everything goes well, it is possible to trap from 50 to 100 deer in a day with drive netting. Releasing several marked animals back into the population allows future estimates of total population numbers. Such estimates usually involve aerial counts of neckbanded and non-neckbanded deer, and comparison with the total number neckbanded earlier.

Under the right conditions, elk can be driven into a net much like deer. Last winter we were able to use this technique on the Judith River Wildlife Management Area southeast of Great Falls. Trap sites should be chosen carefully to prevent the elk from seeing or smelling them, because if the net or ground crew is seen by the elk, the effort will usually fail. Our sites on the Judith were normally on the down slope side of a small hill with some scattered trees for the ground crew to hide behind.

The biggest problem with drive netting elk is their size and weight. It takes a team effort to handle them. This was apparent as we watched one of our stronger wrestlers attempt to bulldog a stubborn cow—it took four persons to hold the elk down, blindfold it, and tie the legs. It took three more to apply the neckband and ear tags, determine age, take a blood sample, and do a pregnancy test. After a day and a half, our tired team of 19 had trapped and released 62 elk. These tagged elk will provide important information on seasonal movements, reproductive biology, behavior during hunting season, and general population structure.

Another capture technique relatively new to Montana is called a "net gun." This device, which originated in New Zealand, consists of a triangular net 10 feet on each side which is

"Drive netting," a capture technique relatively new to Montana, is used when a large number of animals can be found in a relatively small area. The technique (shown above) requires a sizable ground crew, a helicopter, and several hundred feet of sturdy netting. Monitoring deer with colored neckbands, radio transmitters, or ear tags (left) can provide valuable information on deer migration, productivity, and habitat preferences.

packed among three barrels that emerge from the receiver of a rifle. Each barrel contains a projectile that connects to one side of the net. A blank rifle cartridge propels the projectiles and net for a distance of 30 to 50 feet.

This technique allowed us to establish a study of bighorn sheep along the Rocky Mountain Front a few years ago. In the mid-1970s, 36 bighorn sheep had been transplanted from the Sun River area to a site south of Birch Creek. In 1981, we wanted to gather some data on these sheep to determine population trends and patterns of seasonal movements. Dr. Lynn Irby, wildlife professor at MSU, selected Tim Andryk, a graduate student, to begin the research effort. But our attempts to capture enough animals to initiate the study had been repeatedly thwarted by the nomadic nature of these sheep. They would use one spot long enough for us to decide to set up a trap; then we wouldn't see them for a month.

Finally, we decided to try the net gun. Bighorns have one annoying habit (at least) when it comes to capture: They seek the roughest and steepest terrain available when under stress. Our worry was that a netted animal might run far enough to get to the edge of a cliff and then fall trying to untangle itself. So we knew we had to be careful about when and where we used the gun.

The most successful way to use the net gun is with the aid of a skillfully maneuvered helicopter. So one day found two of us anxiously waiting on the ground while the helicopter pilot and gunner skirted some promising ridges high above the plains. Through binoculars we watched a small group of sheep being followed closely by the chopper; then suddenly, we saw it land. Before too long, the helicopter was on its way to pick us up. Once we were settled in the chopper, the pilot explained that they had caught four sheep in one shot and that his partner was trying to hold them all under the net. By the time we arrived, the sheep were mighty nervous and so was the fellow struggling to hold them. In the melee that followed, two of the sheep escaped, leaving a ram and a yearling ewe; we aged these two, radio-collared and ear-tagged them, and inspected them for injury or symptoms of stress. Releasing them from the net is risky business; the ram was set on leaving with or without our help. After a great amount of straining and heaving, the pair was safely released to join the rest of the group.

The fact that the sheep had traveled only a few feet after being netted eased our concern about animals plunging over cliffs. In the next hour, we were able to capture, tag, and release another ram, bringing the total to three. In less than half a day we had been able to accomplish more with the helicopter and net gun than we had been able to in several months of frustrating work with traps!

Other capture techniques have been used with good success and lots of adventure. On one occasion we wanted to tag several other bighorn sheep along the Rocky Mountain Front, and the net gun was not available. So I asked Dr. Dick Kinyon, a veterinarian from Conrad, about various drugs and tranquilizers that might work on bighorn sheep. After some research, we selected M-99, an expensive but very dependable tranquilizer. We figured that if elk and other big game species could be successfully darted from a helicopter, sheep could too.

The day we chose turned out marginally at best. The Front Range was capped by high clouds, and winds were gusting at over 30 miles per hour. Helicopter pilots normally joke about things like that, but not today. As we stood on the ground, our pilot motioned toward the sheep winter range high atop a snow-covered plateau, and said, "Snow's really moving up there!"

Dick, who had volunteered to do the darting, nodded his head in agreement. Then he and the pilot jumped in the helicopter and were off to find an unsuspecting bighorn. It wasn't long until the helicopter returned without Dick. The pilot waved me inside and yelled that Dick had a small ram down and needed help holding him. Within minutes, the pilot was settling the machine against the rim of a rather large, sheer cliff. It occurred to me that perhaps I should have told him about my fear of heights and falling before we took off. I looked questioningly at the pilot, and he yelled, "Yeah, this is it!"

I figured this was "it," all right, as I looked at the skid on my side of the chopper barely touching the ledge, while the other hung out over a 200-foot cliff. I mumbled something about crazy pilots as he motioned me out. The chopper then buzzed away to find a safer place to wait, wavering slightly in the gusting wind.

I immediately spotted Dick hanging onto the front half of a ram. The other half dangled over a precipitous cliff. "It's a good thing these critters have handles," Dick remarked, as I scrambled down a small avalanche chute to help out. He explained that the ram had been darted several hundred yards from the ledge but that the drug doesn't take effect for several minutes. That gave the sheep time to seek cover under the ledge where Dick was now hanging onto him. The wind formed small whirlwinds of snow around us as we dug out a level spot in the snow on which to place the now semiconscious animal.

We quickly placed a radio collar around his neck, recorded all the necessary biological data, and took blood samples to give us information on parasites and disease. Then Dick administered the antidote to the tranquilizer, and we waited anxiously for 90 seconds. The ram moved as though awakening from a deep sleep and, within 30 seconds, he had calmly walked away along the face of the cliff. We darted several more sheep that day, but none was as memorable as that first ram.

We are constantly learning more about Montana's wildlife through studies like those described here. The information gathered enables us in some cases to better assess the potential impacts from proposed developments, and in other cases to better manage big game herds for the benefit of Montana's sportsmen.

Without accurate information on population sizes and trends, nutrition, infectious and non-infectious diseases, and the effects of hunting on these populations, we must be conservative in setting seasons. With adequate information, we can set seasons and harvest quotas that maximize recreational opportunity. We will never know all we would like to know about our secretive wildlife species, but modern capture techniques are helping us close the information gap. ■

MASTER OF CAMOUFLAGE

article and painting by Judy Hoy

THE diminutive flammulated owl *(Otis flammeolus)* is seldom seen in the wild and even less often identified by those who see it. At first glance, it looks like an exquisitely fashioned miniature of a great horned owl.

This pretty little bird, which stands about 6 inches high, gets its name from the bright rust-colored feathers located just above the wing and scattered throughout the plumage. Like its larger relative, the screech owl, the flammulated owl occurs in both grey-brown and red-brown phases. The facial disk—the flat area of feathers around the eyes—is redder than the rest of the head in both color phases. The feathers of the flammulated owl, like those of all owls, are soft and fringed on the edges so that its flight is almost soundless.

It has short, rounded ear tufts, which disappear when the owl's feathers are raised or fluffed out as they usually are when the bird is active. When the owl senses danger, however, it will freeze, making itself as long and slim as possible by compressing its feathers and thrusting its ear tufts upward.

A master of camouflage, the flammulated owl is extremely difficult to spot in its daytime roost. It usually perches near the trunk of a tree or in a dark, shadowy area where its plumage blends well with the surroundings. It closes its dark eyes to mere slits so that light will not be reflected.

The dark brown eyes are an important identifying characteristic. In fact, it is the only small, brown-eyed owl in North America. Montana's other small owls, the saw-whet and the pygmy, have yellow eyes. Like most owls, the flammulated owl can see well both in daylight and darkness; it is most active at dusk and just before dawn.

The bird's length ranges from 5½ to 7 inches, while its wingspan averages 17 or 18 inches. It weighs between 2 and 5 ounces, making it Montana's second smallest owl—the pygmy owl is even smaller. As with most birds of prey, the female flammulated owl is somewhat larger than the male.

Its range includes western mountainous areas from southern British Columbia southward through Mexico and as far south as Guatemala. Grasshoppers, crickets, beetles, spiders, scorpions, and worms make up most of the owl's diet, although it will also take small mammals, especially when brooding its young. Since flammulated owls are mainly insectivorous, they spend winters in the southern part of their range where insects remain available. Because they live in relatively warm temperatures year-round, they do not have feathered feet like most owls.

The mating call sounds like whoo-WHOOT, with strong accent on the second note. The call is low and mellow, but carries long distances. It is repeated over and over with little or no variation, almost as if the notes were produced electronically. After the mating season, the call is one note, sounding like WHOOP.

Flammulated owls migrate north to their breeding areas during the last part of May or early June. They probably pair up before starting north, carrying on their courtship activities during the migration, although the courtship and nesting behavior of these elusive owls has been difficult to document.

The owls select a cavity in a tree for their nest, such as an abandoned flicker or woodpecker hole. They seem to prefer coniferous forests, especially pine, in the northern part of the range. Forest edges with open areas where insects are abundant make ideal habitat. The female lays three or four eggs and incubates them, while the male hunts. The male also protects the nesting territory, although the female, too, is aggressive in protecting the nest and young. After the eggs hatch, the male also has to provide food for the nestlings until the female can leave them to join him in hunting.

By the first two weeks of August, the young are out of the nest and developing their flight muscles. Although still covered with down except for their wings and short tails, they can fly quite well for short distances. They will remain dependent on the parents for several more weeks while they learn how to be self-sufficient. Fortunately, insects are abundant at this time, especially grasshoppers, and by September the young owls are fully feathered and ready to begin the long journey south. It is not known if the owls migrate in flocks, in family groups, or singly.

Their enemies include all sizes of predators and birds of prey, including the smaller pygmy owl. In addition, the flammulated owl's survival is adversely affected by many human activities. The cutting of dead trees containing vital nesting cavities is a prime example.

The flammulated owl is economically beneficial to humans, since it controls harmful insects and rodents. While considered by many to be one of North America's rarest owls, this impression could be due in part to this handsome little owl's small size, elusive nature, and superior mastery of camouflage. ■